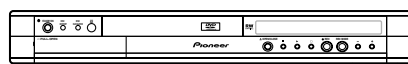


Service Manual



DVR-220-S

ORDER NO.
RRV2958

DVD RECORDER

DVR-220-S

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Model	Type	Power Requirement	Regional restriction codes (Region No.)	Serial No. Please confirm 3rd & 4th alphabetical letters.
DVR-220-S	WYXK	AC220-240V	2	&&UK#####\$\$
DVR-220-S	WYXK/SP	AC220-240V	2	&&UK#####\$\$
DVR-220-S	WVXK	AC220-240V	2	&&UK#####\$\$
DVR-220-S	WYXU	AC220-240V	2	&&PG#####\$\$

• When servicing this model, some service procedures may reset the settings that customer set (*) to the factory default settings. Make sure to explain this to the customer.

(*) : Initial Setup (Clock Setting, Remote Control Set, Channel settings, Video Out settings, Audio In settings, Audio Out settings, Language settings)

Refer to the chapter 12 of the Operating Instructions for more details.



For details, refer to "Important symbols for good services".

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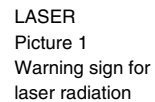
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[Important symbols for good services]

In this manual, the symbols shown-below indicate that adjustments, settings or cleaning should be made securely. When you find the procedures bearing any of the symbols, be sure to fulfill them:

1. Product safety

You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.

2. Adjustments

To keep the original performances of the product, optimum adjustments or specification confirmation is indispensable. In accordance with the procedures or instructions described in this manual, adjustments should be performed.

3. Cleaning

For optical pickups, tape-deck heads, lenses and mirrors used in projection monitors, and other parts requiring cleaning, proper cleaning should be performed to restore their performances.

4. Shipping mode and shipping screws

To protect the product from damages or failures that may be caused during transit, the shipping mode should be set or the shipping screws should be installed before shipping out in accordance with this manual, if necessary.

5. Lubricants, glues, and replacement parts

Appropriately applying grease or glue can maintain the product performances. But improper lubrication or applying glue may lead to failures or troubles in the product. By following the instructions in this manual, be sure to apply the prescribed grease or glue to proper portions by the appropriate amount. For replacement parts or tools, the prescribed ones should be used.

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DVR-220-S

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1. SPECIFICATIONS

Specifications

General

System DVD-Video, DVD-R/RW,
Video-CD, Super VCD, CD,
CD-R/RW (WMA, MP3, JPEG, CD-DA)

Power requirements 220–240 V, 50/60 Hz

Power Consumption
DVR-220 31 W

Power consumption in standby mode 0.68 W
(Front panel display: off)

Weight 4.0 kg

Dimensions 420 (W) x 59 (H) x 339 (D) mm

Operating temperature +5°C to +35°C

Operating humidity 5% to 85%
(no condensation)

TV system PAL/SECAM/
NTSC (external input only)

Recording

Recording format DVD Video Recording
DVD-VIDEO

Recordable discs

DVD-RW (DVD Re-recordable disc)

DVD-R (DVD Recordable disc)

Video recording format

Sampling frequency 13.5MHz

Compression format MPEG

Audio recording format

Sampling frequency 48kHz

Compression format Dolby Digital or Linear PCM
(uncompressed)

Recording time

Fine (FINE) Approx. 1 hour

Standard Play (SP) Approx. 2 hours

Long Play (LP) Approx. 4 hours

Extended Play (EP) Approx. 6 hours

Manual Mode (MN). Approx. 1–6 hours

Tuner

Receivable channels

	PAL B/G		PAL I	
	Frequency	Channel	Frequency	Channel
VHF (low)	47 - 89 MHz	E2 - E4 X - Z	44 - 89 MHz	A - C X - Z
VHF (high)	104 - 300 MHz	E5 - E12 S1 - S20 M1 - M10 U1 - U10	104 - 300 MHz	D - J 11, 13 S1 - S20
Hyper	302 - 470 MHz	S21 - S41	302 - 470 MHz	S21 - S41
UHF	470 - 862 MHz	E21 - E69	470 - 862 MHz	E21 - E69

	SECAM L		SECAM D/K	
	Frequency	Channel	Frequency	Channel
VHF (low)	49 - 65 MHz	2 - 4	49 - 94 MHz	R1 - R5
VHF (high)	104 - 300 MHz	5 - 10 B - Q	104 - 300 MHz	R6 - R12 S1 - S20
Hyper	300 - 470 MHz	S21 - S41	302 - 470 MHz	S21 - S41
UHF	470 - 862 MHz	21 - 69	470 - 862 MHz	E21 - E69

STEREO
B/G - A2
I - NICAM
L - NICAM
B/G - NICAM
D/K - NICAM

Timer

Programs 1 month/32 programs

Clock Quartz lock (24-hour digital display)

Power off memory Approx. 5 years (after manufacture)

Input/Output

VHF/UHF antenna input/output terminal . . . VHF/UHF set
75 Ω (IEC connector)

Video input Input 1 (rear), 2 (front)

Input level 1 Vp-p (75 Ω)

Jacks AV connector 2 (Input 1),
RCA jack (Input 2)

Video output AV1 Output

Output level 1 Vp-p (75 Ω)

Jacks AV connector 1 (AV1)
RCA jack (Output)

S-Video input Input 1 (rear), 2 (front)

Y (luminance) - Input level 1 Vp-p (75 Ω)

C (colour) - Input level 286 mVp-p (75 Ω)

Jacks AV connector 2 (Input 1),
4 pin mini DIN (Input 2)

S-Video output AV1 / Output

Y (luminance) - Output level 1 Vp-p (75 Ω)

C (colour) - Output level 286 mVp-p (75 Ω)

Jacks AV connector 1 (AV1),
4 pin mini DIN (Output)

RGB input

Input level 0.7 Vp-p (75Ω)

Jacks AV connector 2 (Input 1)

RGB output

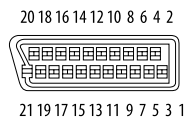
Output level 0.7 Vp-p (75Ω)

Jacks AV connector 1

Audio input.	Input 1 (rear), 2 (front) L/R
Input level	
During audio input.2V rms
	(Input impedance: more than 22 kΩ)
Jacks	AV connector 2 (Input 1), RCA jacks (Input 2)
Audio output	AV1 Output
During audio output2V rms
	(Output impedance: less than 1.5 kΩ)
Jacks	AV connector 1 (AV1), RCA jacks (Output)
Control input.	Mini jack

AV Connectors (21-pin connector assignment)

AV connector input/output 21-pin connector
This connector provides the video and audio signals for connection to a compatible colour TV or monitor.



PIN no.	AV1(RGB)-TV / AV2(INPUT 1)
1	Audio 2/R out / Audio 2/R in
2	— / Audio 2/R in
11	G out / G in
3	Audio 1/L out / Audio 1/L in
6	— / Audio 1/L in
15	R or C out / R or C in
4	GND
17	GND
7	B out / B in
19	Video out or Y out / Video out
20	— / Video in or Y in
8	Status
21	GND

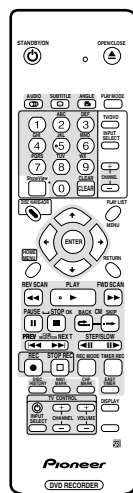
Supplied accessories

Remote control.	1
Dry cell batteries (AA/R6P)	2
Audio / Video cable (red/white/yellow)	1
RF antenna cable	1
Power cable	1
Operating Instructions	6
Warranty card	1

Note: The specifications and design of this product are subject to change without notice, due to improvement.

● Accessories

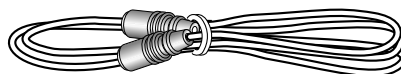
- Remote control ×1
(VXX2908 : WYXK, WYXK/SP, WYXU)
(VXX2929 : WVXK)



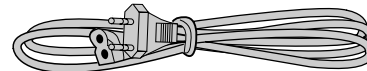
- Dry cell batteries ×2
(AA/R6P)



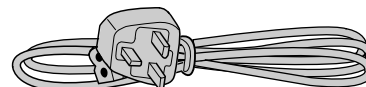
- RF antenna cable ×1
(VDE1075)



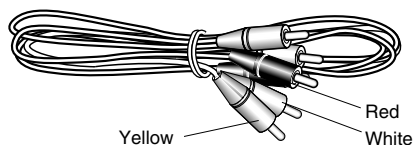
- Power cable ×1
(ADG1154 : WYXK, WYXK/SP, WYXU)



(ADG1156 : WVXK)



- Audio / Video cable (L=1.5m) ×1
(red/white/yellow)
(XDE3049 : WYXK, WYXK/SP, WVXK)
(VDE1077 : WYXU)

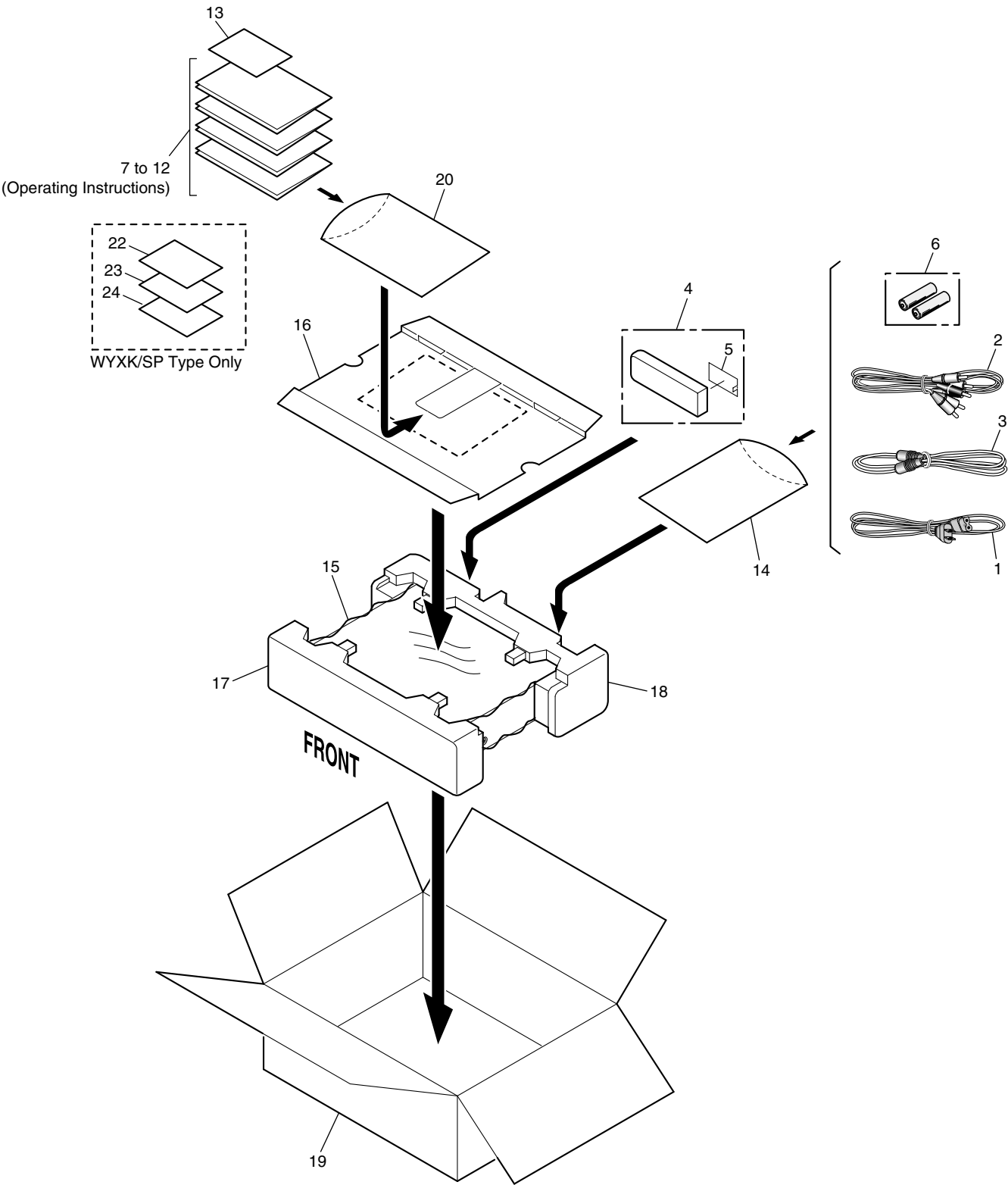


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2. EXPLODED VIEWS AND PARTS LIST

NOTES: ● Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
● The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
● Screws adjacent to ▼ mark on product are used for disassembly.
● For the applying amount of lubricants or glue, follow the instructions in this manual.
(In the case of no amount instructions, apply as you think it appropriate.)

2.1 PACKING



PACKING SECTION Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
⚠ 1	Power Cable	See Contrast table (2)	12	Operating Instructions (Spanish)	See Contrast table (2)
2	Audio / Video Cable	See Contrast table (2)	NSP 13	Warranty Card	ARY7065
3	RF Antenna Cable	VDE1075	14	Polyethylene Bag	VHL1051
4	Remote Control	See Contrast table (2)	15	Mirror Sheet	VHL1006
5	Battery Cover	AZN7933	16	IM Holder	See Contrast table (2)
NSP 6	Dry Cell Battery (R6P, AA)	See Contrast table (2)	17	Front Pad	See Contrast table (2)
7	Operating Instructions (English)	See Contrast table (2)	18	Rear Pad	See Contrast table (2)
8	Operating Instructions (French)	See Contrast table (2)	19	Packing Case	See Contrast table (2)
9	Operating Instructions (German)	See Contrast table (2)	20	Polyethylene Bag	See Contrast table (2)
10	Operating Instructions (Italian)	See Contrast table (2)	21	•••••	
11	Operating Instructions (Dutch)	See Contrast table (2)	NSP 22	Information List	See Contrast table (2)
			NSP 23	Service Phone List	See Contrast table (2)
			NSP 24	Connection Guide	See Contrast table (2)

(2) CONTRAST TABLE

DVR-220-S/WYXK, WYXK/SP, WVXK and WYXU are constructed the same except for the following :

Mark	No.	Description	DVR-220-S /WYXK	DVR-220-S /WYXK/SP	DVR-220-S /WVXK	DVR-220-S /WYXU
⚠	1	Power Cable	ADG1154	ADG1154	ADG1156	ADG1154
	2	Audio / Video Cable	XDE3049	XDE3049	XDE3049	VDE1077
	4	Remote Control	VXX2908	VXX2908	VXX2929	VXX2908
NSP	6	Dry Cell Battery (R6P, AA)	VEM1017	VEM1017	VEM1017	VEM1030
	7	Operating Instructions (English)	VRB1334	Not used	VRB1335	VRB1334
	8	Operating Instructions (French)	VRC1200	Not used	Not used	VRC1200
	9	Operating Instructions (German)	VRC1201	Not used	Not used	VRC1201
	10	Operating Instructions (Italian)	VRC1202	Not used	Not used	VRC1202
	11	Operating Instructions (Dutch)	VRC1203	Not used	Not used	VRC1203
	12	Operating Instructions (Spanish)	VRC1220	VRC1220	Not used	VRC1220
	16	IM Holder	VHC1117	VHC1117	VHC1117	VHC1115
	17	Front Pad	VHA1370	VHA1370	VHA1370	VHA1364
	18	Rear Pad	VHA1371	VHA1371	VHA1371	VHA1365
	19	Packing Case	VHG2512	VHG2539	VHG2514	VHG2571
	20	Polyethylene Bag	AHG7097	VHL1051	VHL1051	AHG7097
NSP	22	Information List	Not used	VRR1051	Not used	Not used
NSP	23	Service Phone List	Not used	VRR1052	Not used	Not used
NSP	24	Connection Guide	Not used	VRR1053	Not used	Not used

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EXTERIOR SECTION Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	TUNB Assy	VWV2003	NSP 31	Writer Stay L	VNE2336
2	JCKB Assy	VWV2030	NSP 32	Writer Stay R	VNE2337
3	MAIN Assy	VWV2000	NSP 33	PCB Base	VNE2339
4	FRJB Assy	VWV2004	NSP 34	Heatsink	VNH1070
5	•••••		35	SYPS Cover	VNK5426
6	SDEB Assy	VWV2033	NSP 36	Base Chassis	See Contrast table (2)
7	POWER SUPPLY Unit	VWR1381	NSP 37	Binder (BK-1)	ZCA-BK1
8	DRIVE Assy R7R (for Service)	VXX2926	38	DVD RW Badge	VAM1140
9	Connector Assy (2P)	PF02PP-C07	39	Tray Sheet B	See Contrast table (2)
10	Connector Assy (4P)	PF04EE-S22	40	Tray Panel	See Contrast table (2)
11	Connector Assy (15P)	PF15PP-D47	41	Bonnet Label	See Contrast table (2)
12	Flexible Cable (8P)	VDA1997	NSP 42	Tape	ZTA-156A-19
13	Flexible Cable (24P)	VDA1998	43	DC Fan Motor	VXM1114
14	Flexible Cable (32P)	VDA1999	NSP 44	P. Plate Holder	PNY-405
15	•••••		45	Screw	BCZ40P060FNI
16	Flexible Cable (13P)	VDA2001	46	Screw	PBZ30P080FTC
17	Flexible Cable (40P)	VDA2006	47	Screw	AMZ30P060FTC
18	Flexible Cable (15P)	VDA2041	48	Screw	BBZ30P040FTC
19	Rubber Foot	VEB1349	49	Screw	BPZ30P080FTC
20	Radiation Sheet	VEB1360	50	Screw	BBZ30P060FTC
NSP 21	PC Support	VEC1749	51	Earth Plate TU	VBK1153
22	Heatsink Cushion	VEC2363	NSP 52	Clamp	VEC2418
23	Gasket Sheet	VEC2394	NSP 53	Tuner Stay	VNE2338
24	Spacer	VEC2413	54	Fan Duct	VNK5427
25	FFC Protector	VEC2436	55	Screw	BPZ30P250FTC
26	Gasket 75 x 7T	VEC2439	56	Seal/Tape	See Contrast table (2)
27	Gasket Sheet 2	VEC2440			
28	Rear Panel	See Contrast table (2)			
29	Bonnet Case S	See Contrast table (2)			
NSP 30	Bonnet Angle	VNE2335			

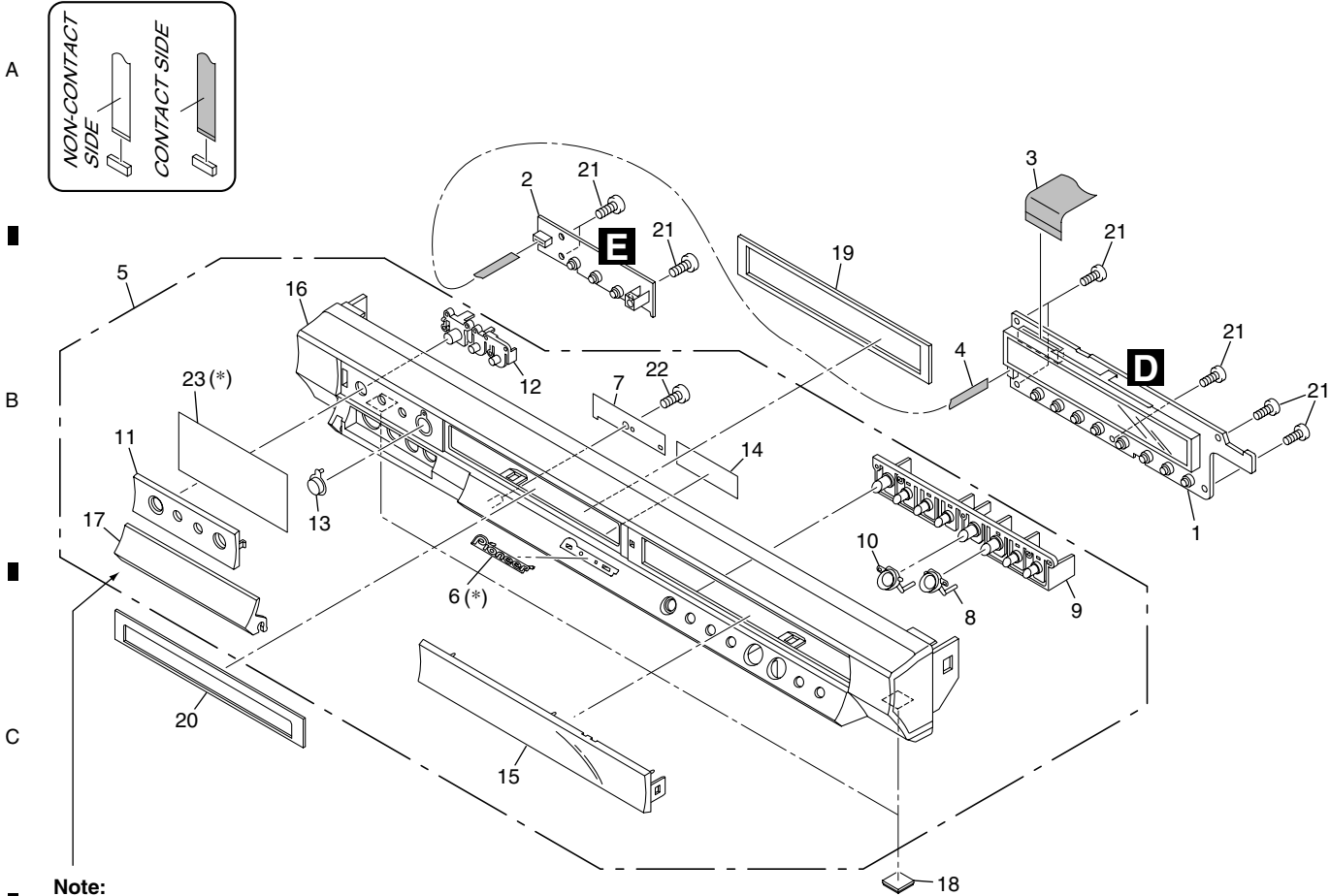
(2) CONTRAST TABLE

DVR-220-S/WYXK, WYXK/SP, WVXK and WYXU are constructed the same except for the following :

Mark	No.	Description	DVR-220-S /WYXK	DVR-220-S /WYXK/SP	DVR-220-S /WVXK	DVR-220-S /WYXU
NSP NSP	28	Rear Panel	VNA2689	VNA2689	VNA2689	VNA2758
	29	Bonnet Case S	VXX2938	VXX2938	VXX2938	VXX2925
	36	Base Chassis	VNB1042	VNB1042	VNB1042	Not used
	36	Base Chassis Assy	Not used	Not used	Not used	VXA2681
	39	Tray Sheet B	VEC2450	VEC2450	VEC2450	VEC2409
	40	Tray Panel	VNK5519	VNK5519	VNK5519	VNK5444
	41	Bonnet Label	VRW2110	VRW2110	VRW2113	VRW2110
	56	Seal/Tape	ZTA-156A-19	ZTA-156A-19	ZTA-156A-19	CNM8871

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2.3 FRONT PANEL SECTION



Note:
When replacing the jack door, first fully open it. If the jack door is not fully open during replacement, it may unexpectedly fall out after being replaced.

(*) No.6, No.23 : These parts are included in the Front Panel Assy for WYXU type, and not included in the Front Panel Assy for WYXK, WYXK/SP and WVXK types.

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FRONT PANEL SECTION Parts List

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	FLKY Assy	VWG2489	NSP 16	Front Panel	See Contrast table (2)
2	KIRB Assy	VWG2490	17	Jack Door	See Contrast table (2)
3	Flexible Cable (19P)	VDA2002	18	Rubber Foot	VEB1349
4	Flexible Cable (7P)	VDA2005	19	Drive Sheet	VEC2345
5	Front Panel Assy	See Contrast table (2)	20	Panel Sheet	VEC2446
6	Pioneer Name Plate	VAM1146	21	Screw	BPZ30P080FTC
7	Door Spring	See Contrast table (2)	22	Screw	See Contrast table (2)
NSP 8	Copy Ring	See Contrast table (2)	NSP 23	Mirror Sheet	VHL1082
NSP 9	Main Key	See Contrast table (2)			
NSP 10	REC Ring	See Contrast table (2)			
NSP 11	Sub Panel	See Contrast table (2)			
NSP 12	Power Key	See Contrast table (2)			
NSP 13	IR Window	See Contrast table (2)			
14	•••••				
NSP 15	FL Lens	See Contrast table (2)			

(2) CONTRAST TABLE

DVR-220-S/WYXK, WYXK/SP, WVXK and WYXU are constructed the same except for the following :

Mark	No.	Description	DVR-220-S /WYXK	DVR-220-S /WYXK/SP	DVR-220-S /WVXK	DVR-220-S /WYXU
	5	Front Panel Assy	VXA2657	VXA2657	VXA2658	VXA2650
	7	Door Spring	VBK1152	VBK1152	VBK1152	VBK1151
NSP	8	Copy Ring	VNK5533	VNK5533	VNK5533	Not used
NSP	9	Main Key	VNK5504	VNK5504	VNK5504	VNK5420
NSP	10	REC Ring	VNK5506	VNK5506	VNK5506	VNK5425
NSP	11	Sub Panel	VNK5512	VNK5512	VNK5512	VNK5442
NSP	12	Power Key	VNK5507	VNK5507	VNK5507	VNK5443
NSP	13	IR Window	VNK5510	VNK5510	VNK5510	VNK5446
NSP	15	FL Lens	VNK5515	VNK5515	VNK5515	VNK5484
NSP	16	Front Panel	VNK5499	VNK5499	VNK5499	VNK5489
	17	Jack Door	VNK5503	VNK5503	VNK5502	VNK5496
	22	Screw	BPZ30P080FNI	BPZ30P080FNI	BPZ30P080FNI	BPZ30P080FTC

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

3.1 BLOCK DIAGRAM

3.1.1 OVERALL BLOCK DIAGRAM

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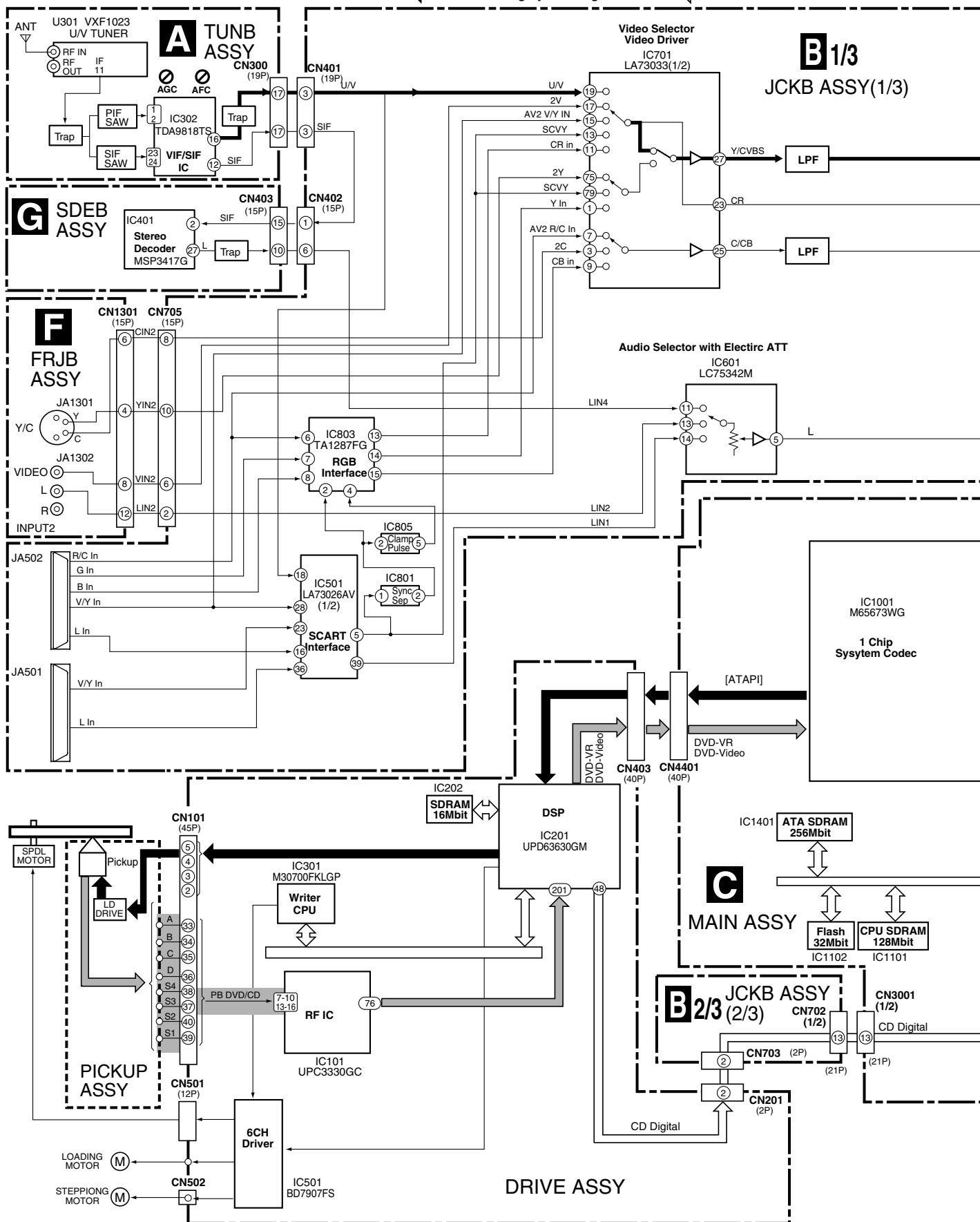
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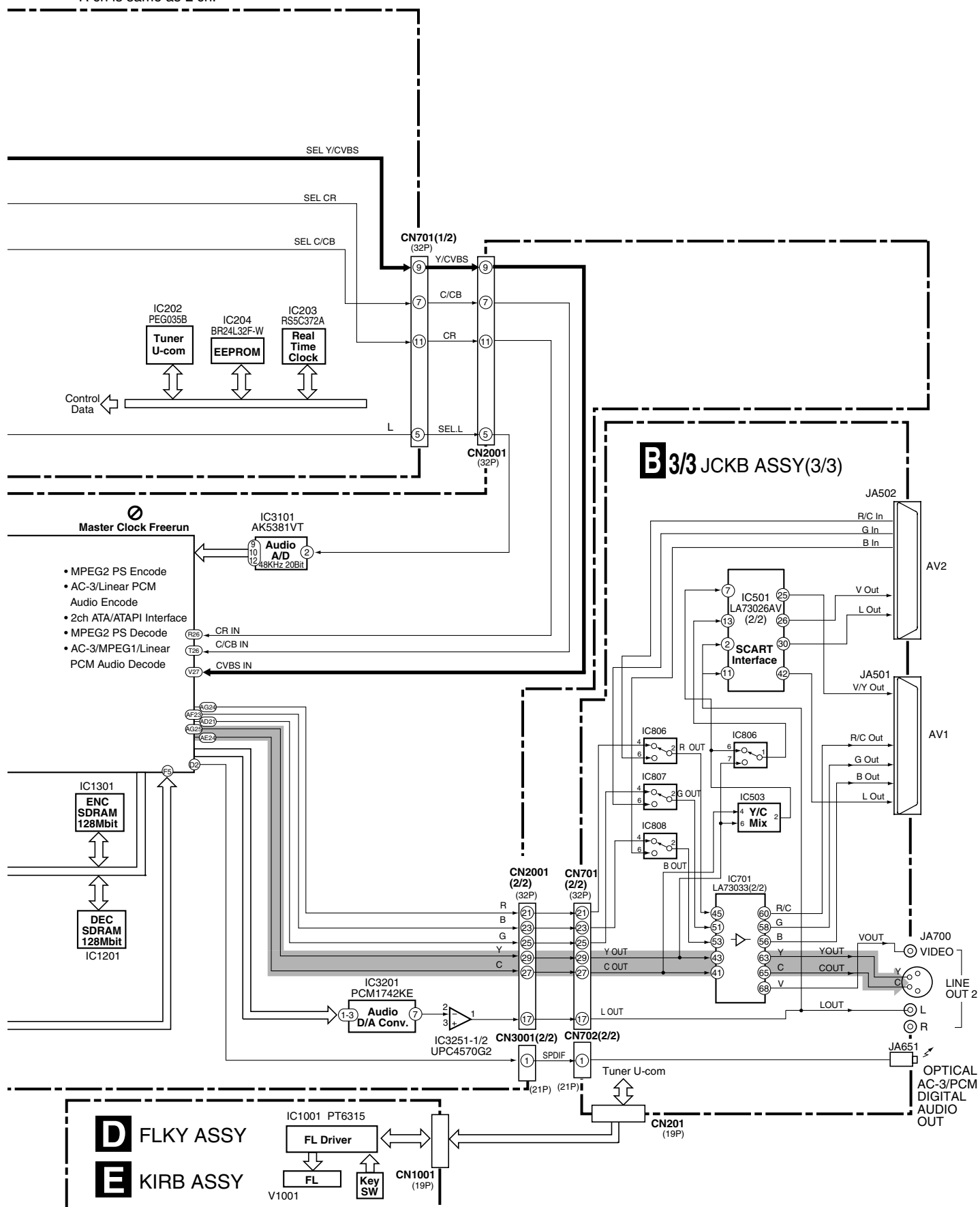
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← : Recording system signal route ← : Playback system signal route

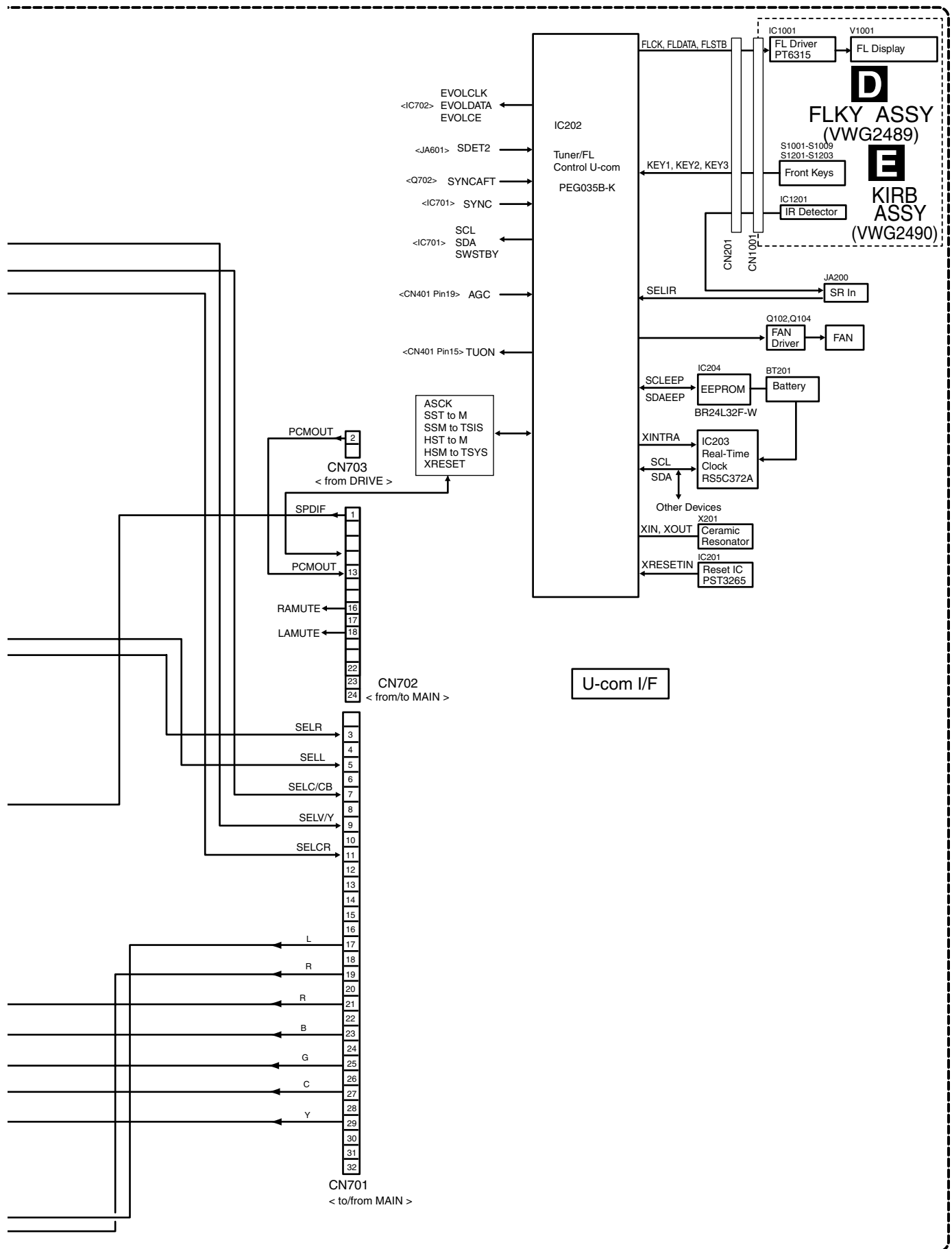


• R ch is same as L ch.



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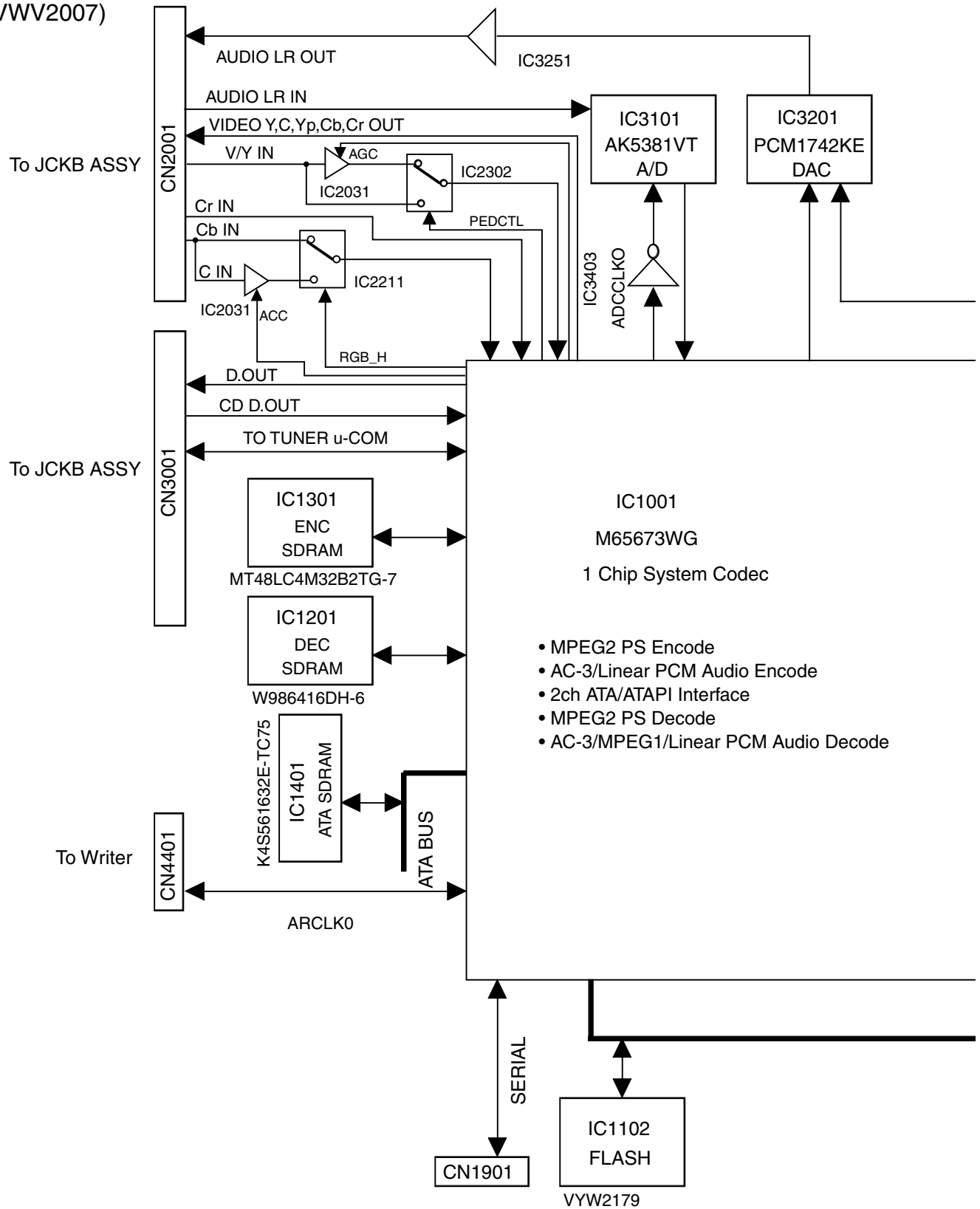


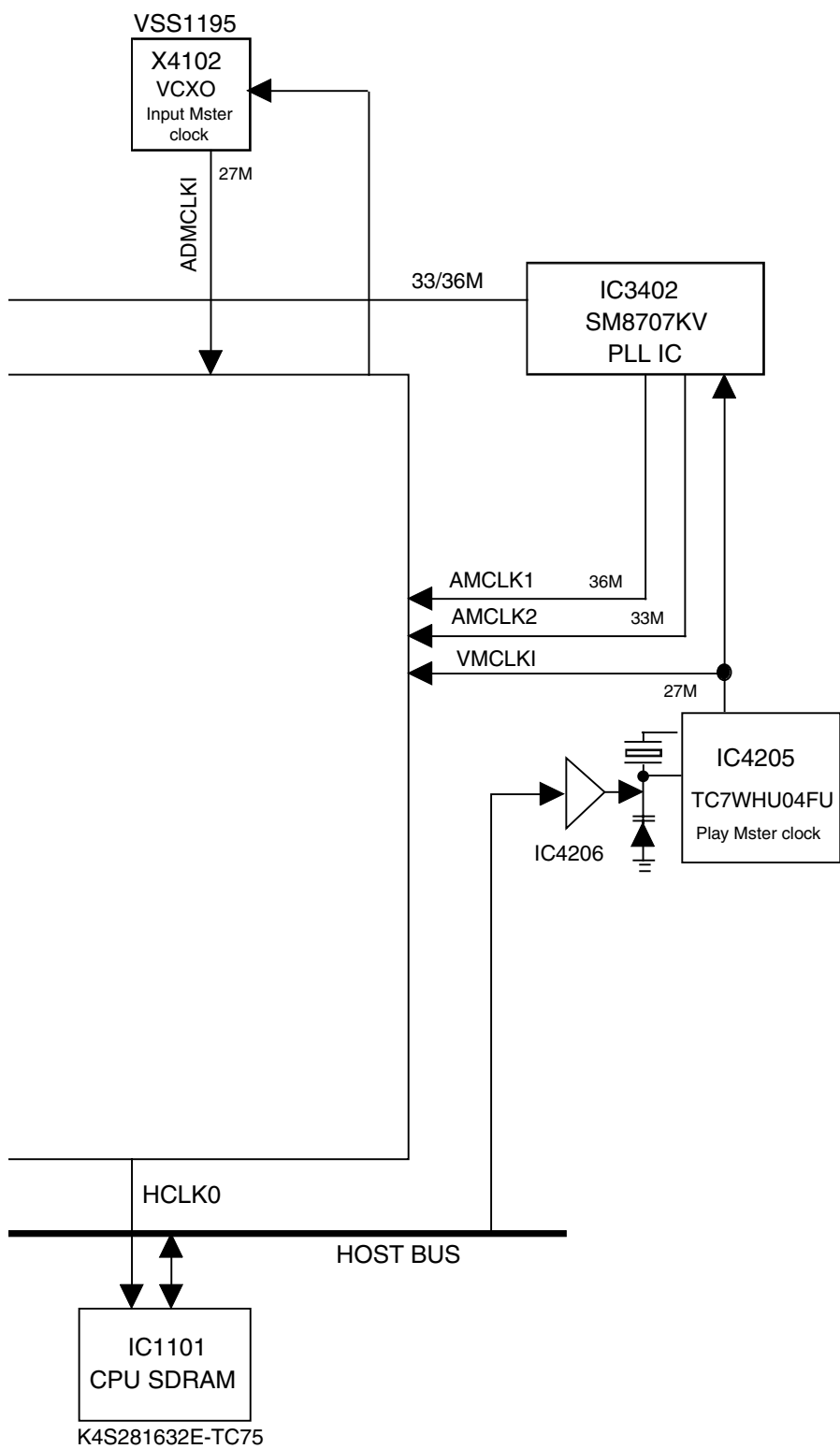


3.1.3 MAIN ASSY BLOCK DIAGRAM

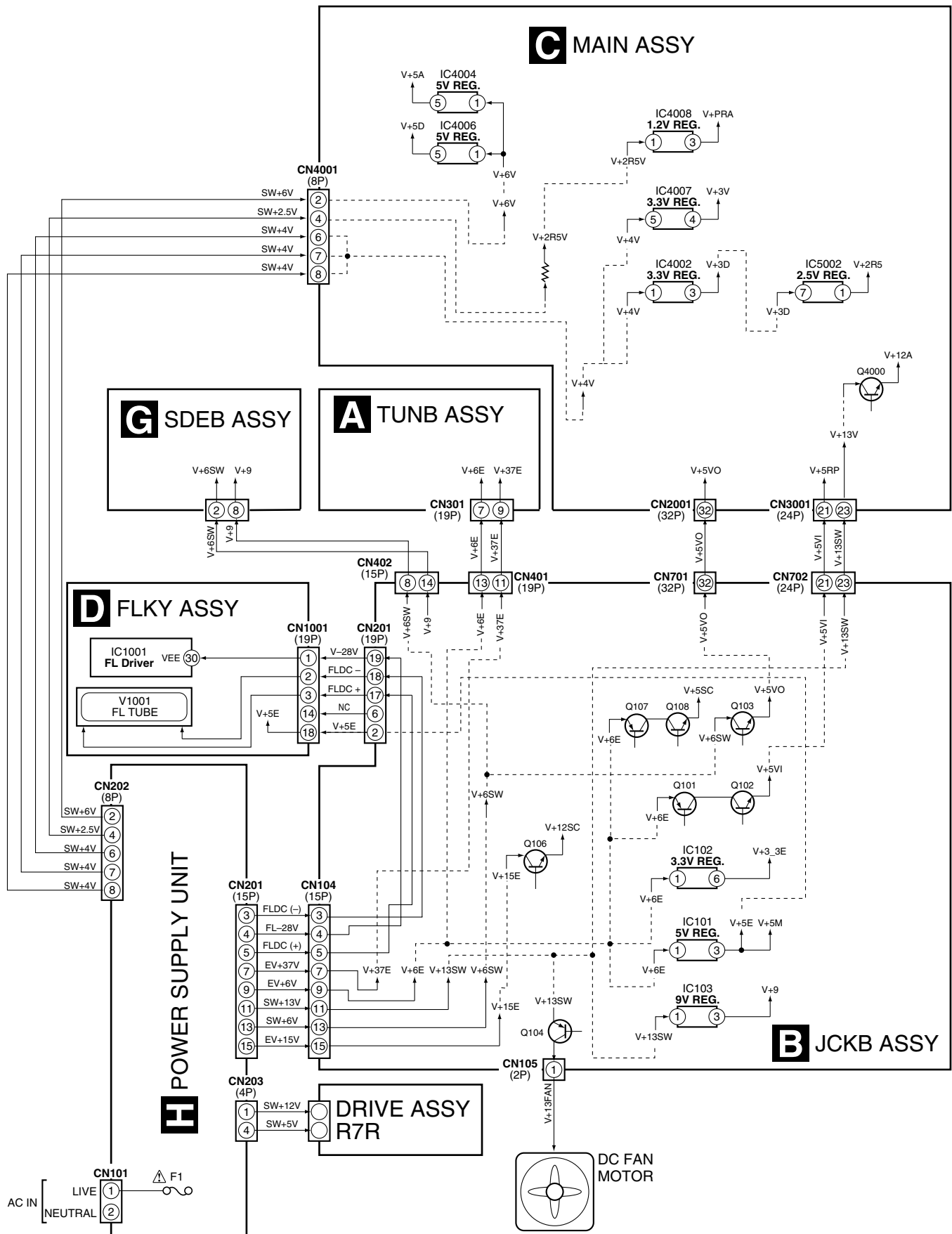
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C MAIN ASSY
(VWV2007)





3.1.4 POWER BLOCK DIAGRAM



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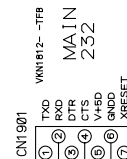
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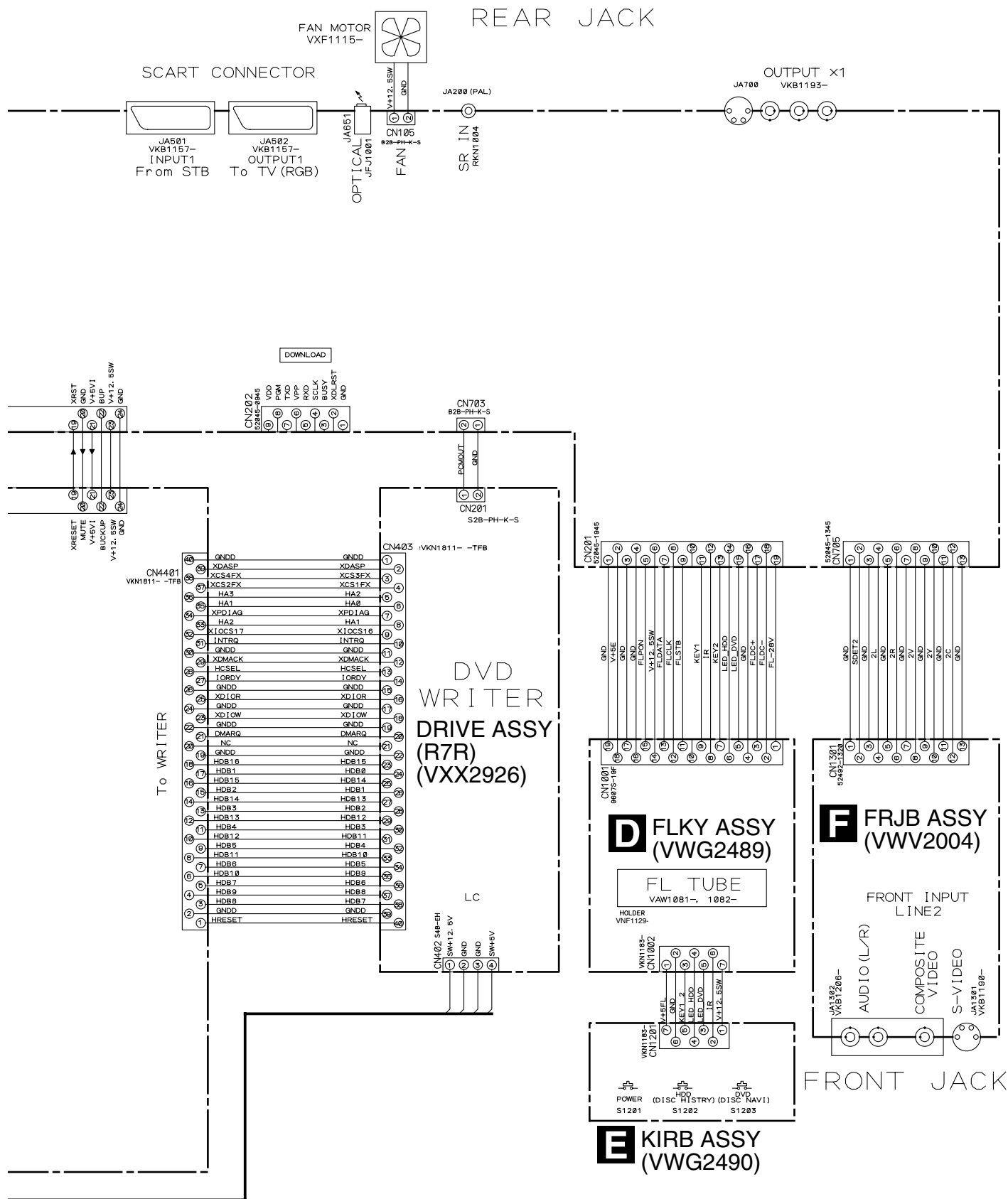
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DVR-220-S

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- When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".
- The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
-  : The power supply is shown with the marked box.

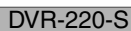


4



4

F



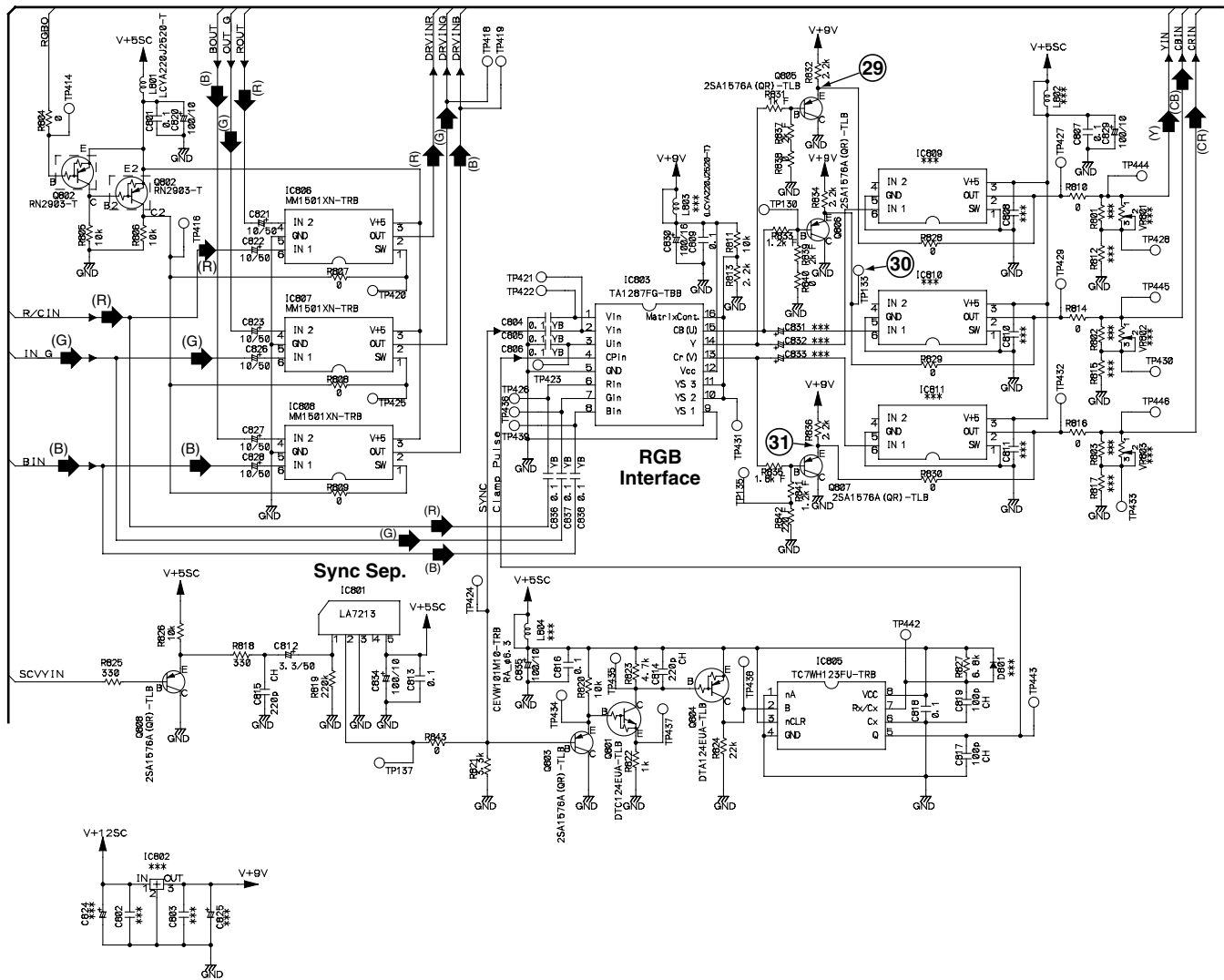
A



1

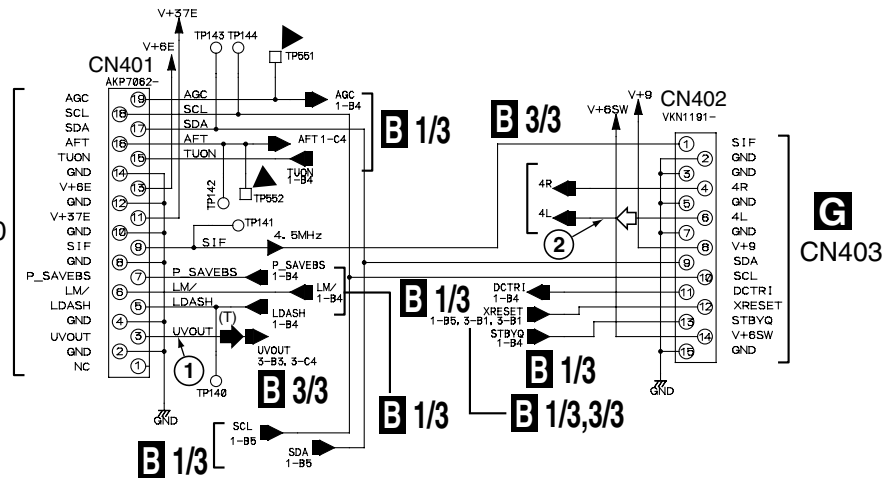
3.5 JCKB ASSY(2/3)

B 2/3 JCKB ASSY (VWV2030)



A CN300

- (T) : Video Signal Route (TUNER)
- (R) : Video Signal Route (R)
- (G) : Video Signal Route (G)
- (B) : Video Signal Route (B)
- (Y) : Video Signal Route (Y)
- (CB) : Video Signal Route (CB)
- (CR) : Video Signal Route (CR)
- : Audio Signal Route (L ch)



*** : STAND BY

B 2/3



5



6



7



8



A



B



C



D



E



F



5



6



7



8



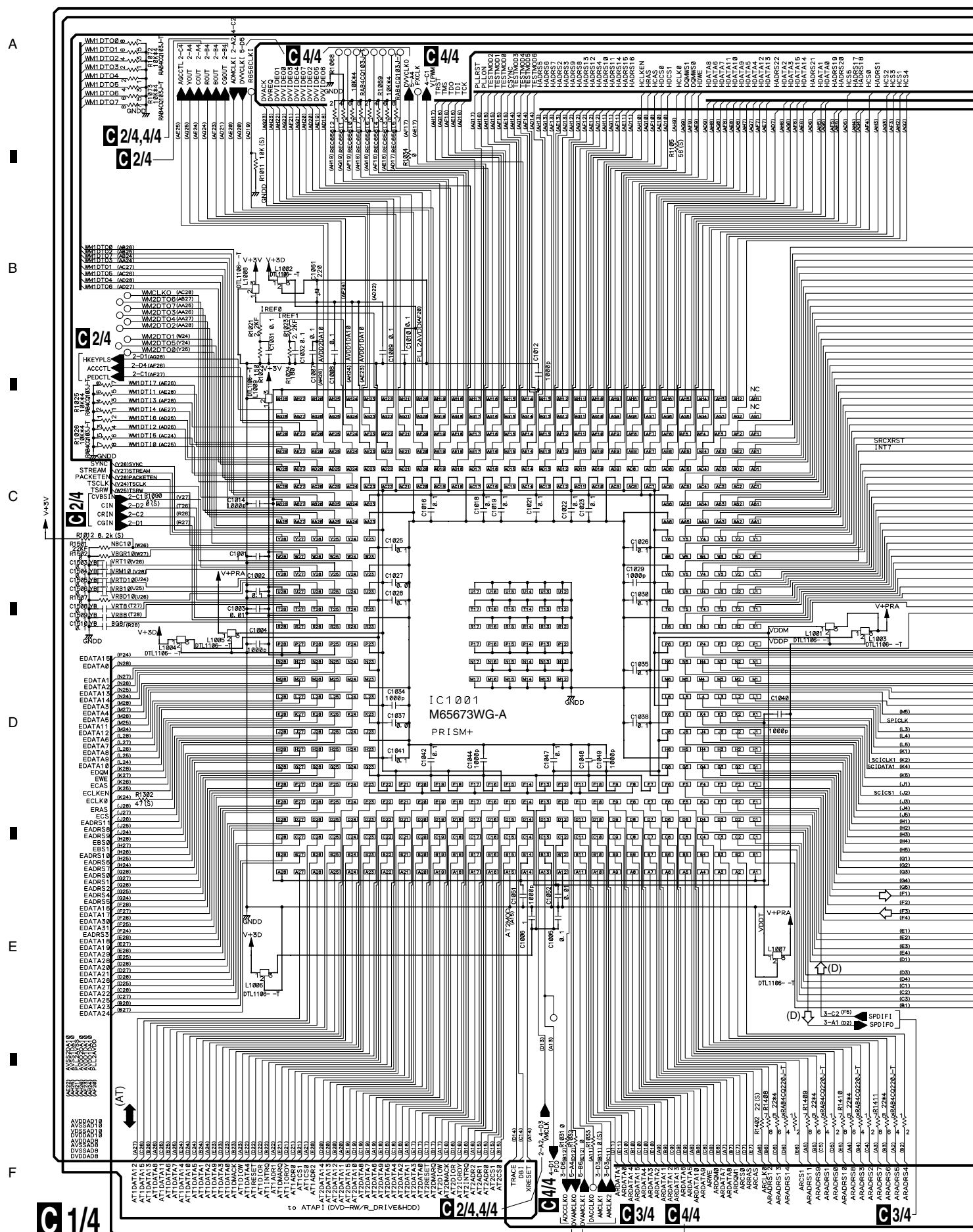
△

A



4

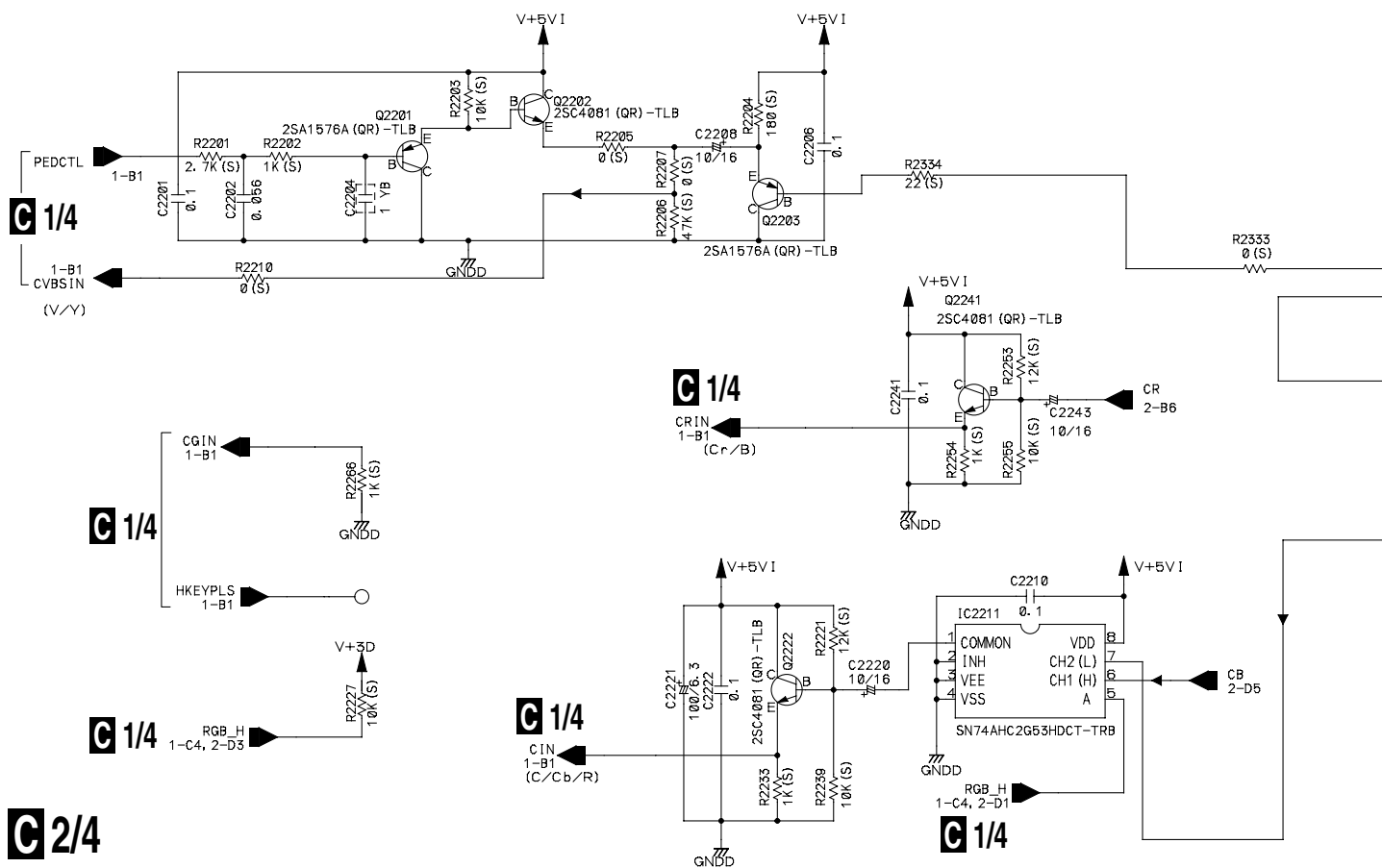
3.7 MAIN ASSY (1/4)





3.8 MAIN ASSY (2/4)

C 2/4 MAIN ASSY (VWV2000)





△





△

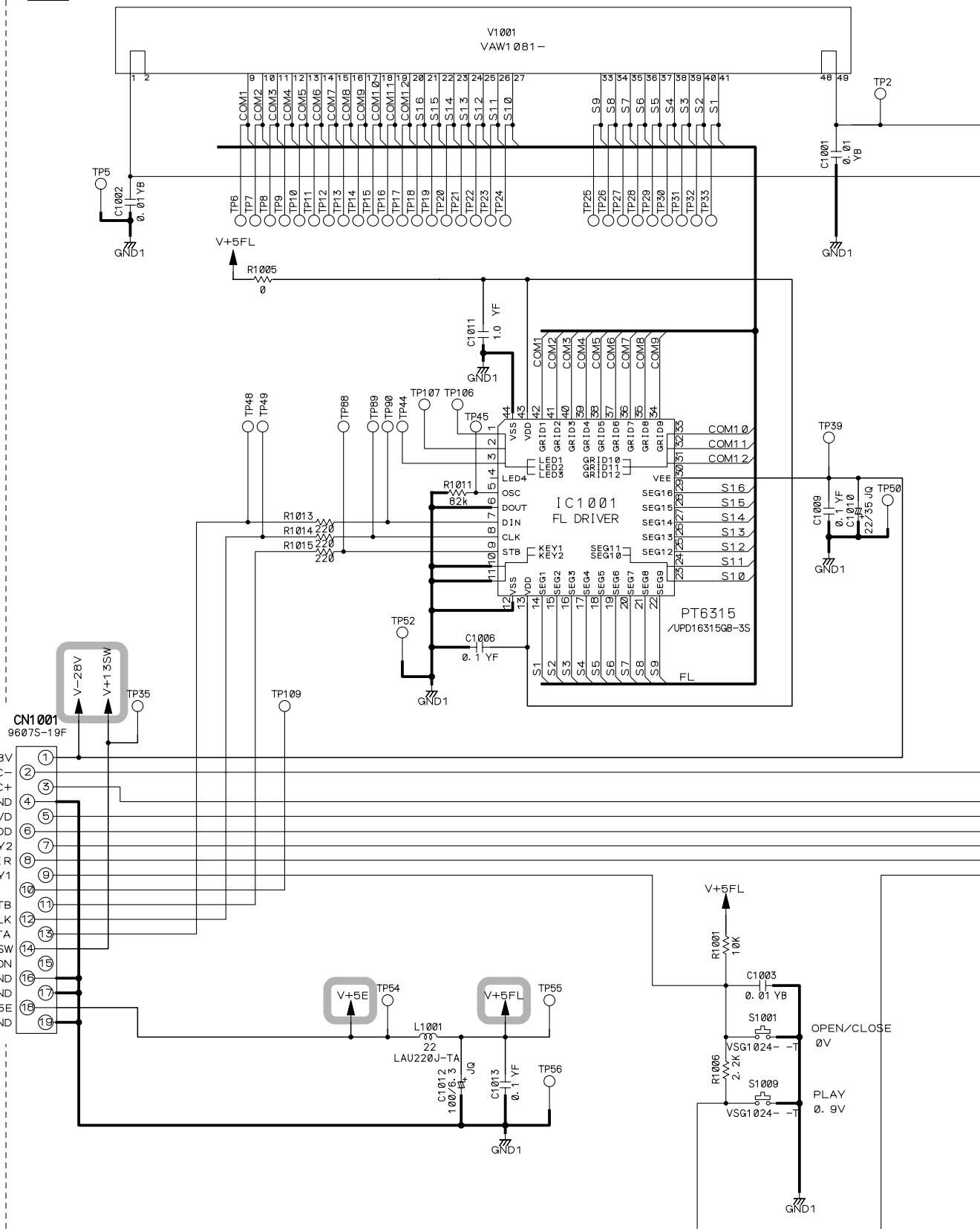


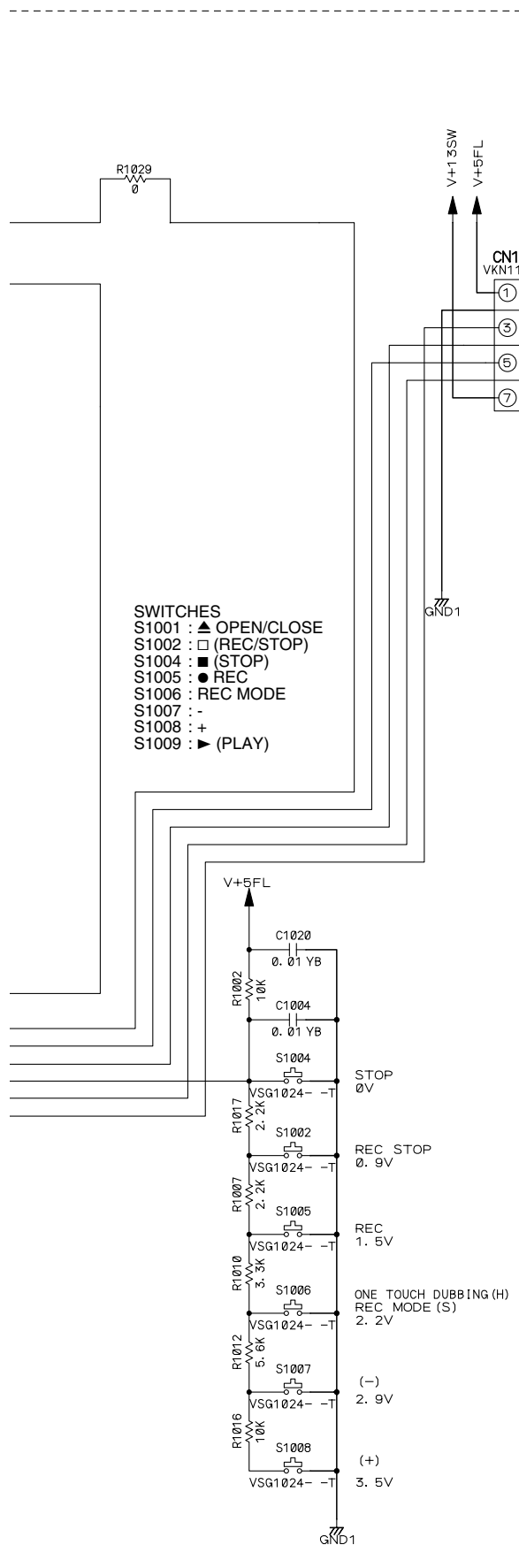


39

3.11 FLKY, KIRB and FRJB ASSYS

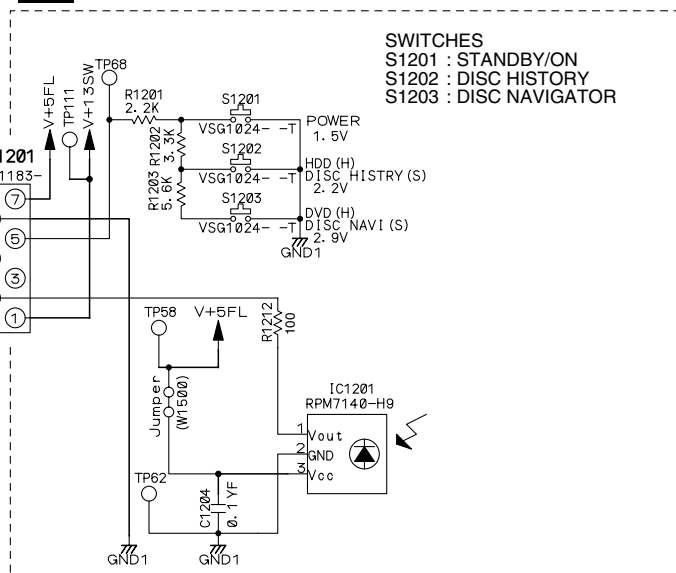
D FLKY ASSY (VWG2489)



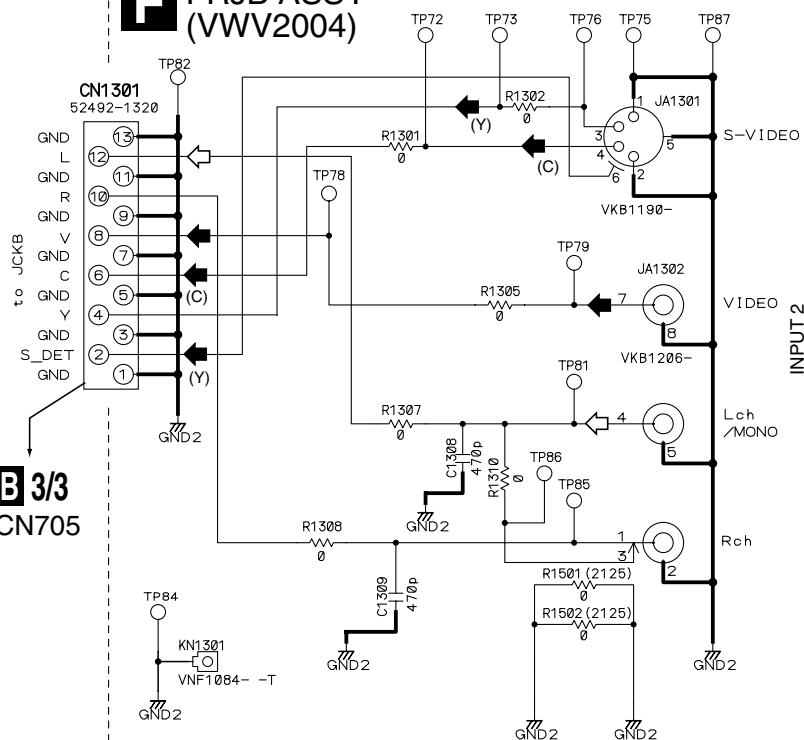


(Y) : Video Signal Route
 (C) : Video Signal Route (C)
 : Video Signal Route (Y)

KIRB ASSY (VWG2490)



FRJB ASSY (VWV2004)

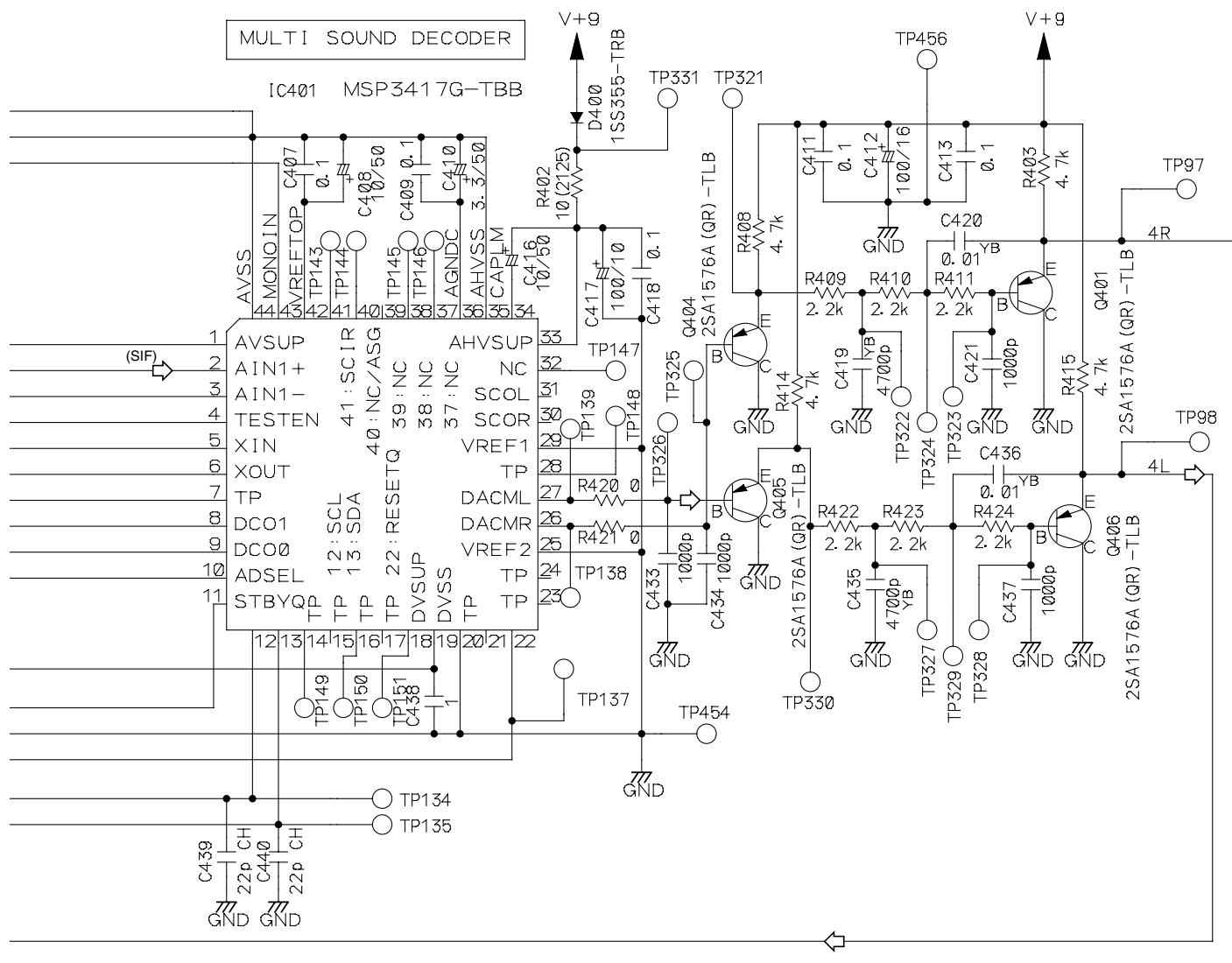


B 3/3
 CN705

A



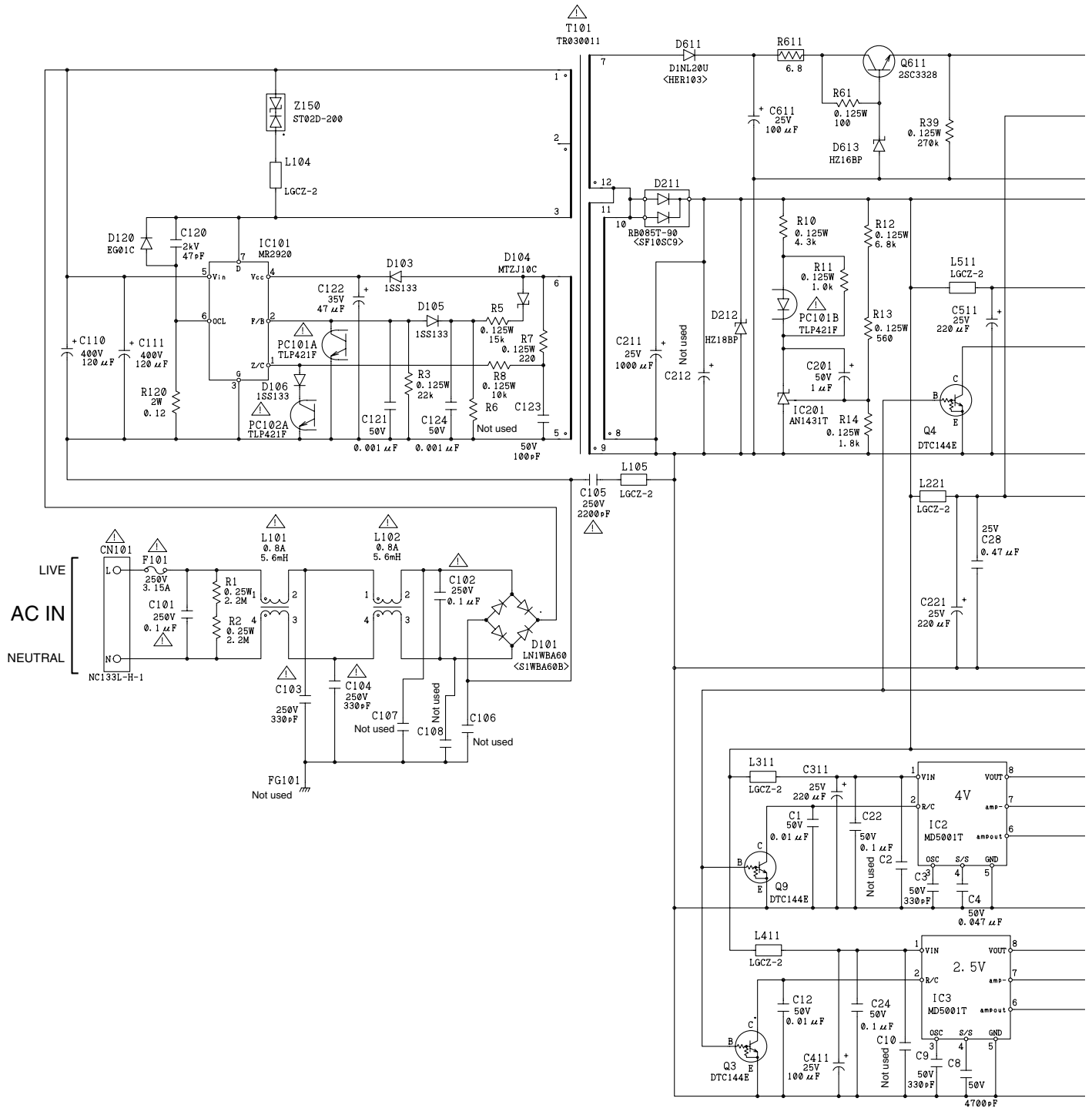
(SIF) ⇨ : SIF Signal Route (TUNER)
 ⇨ : AUDIO Signal Route (L ch)

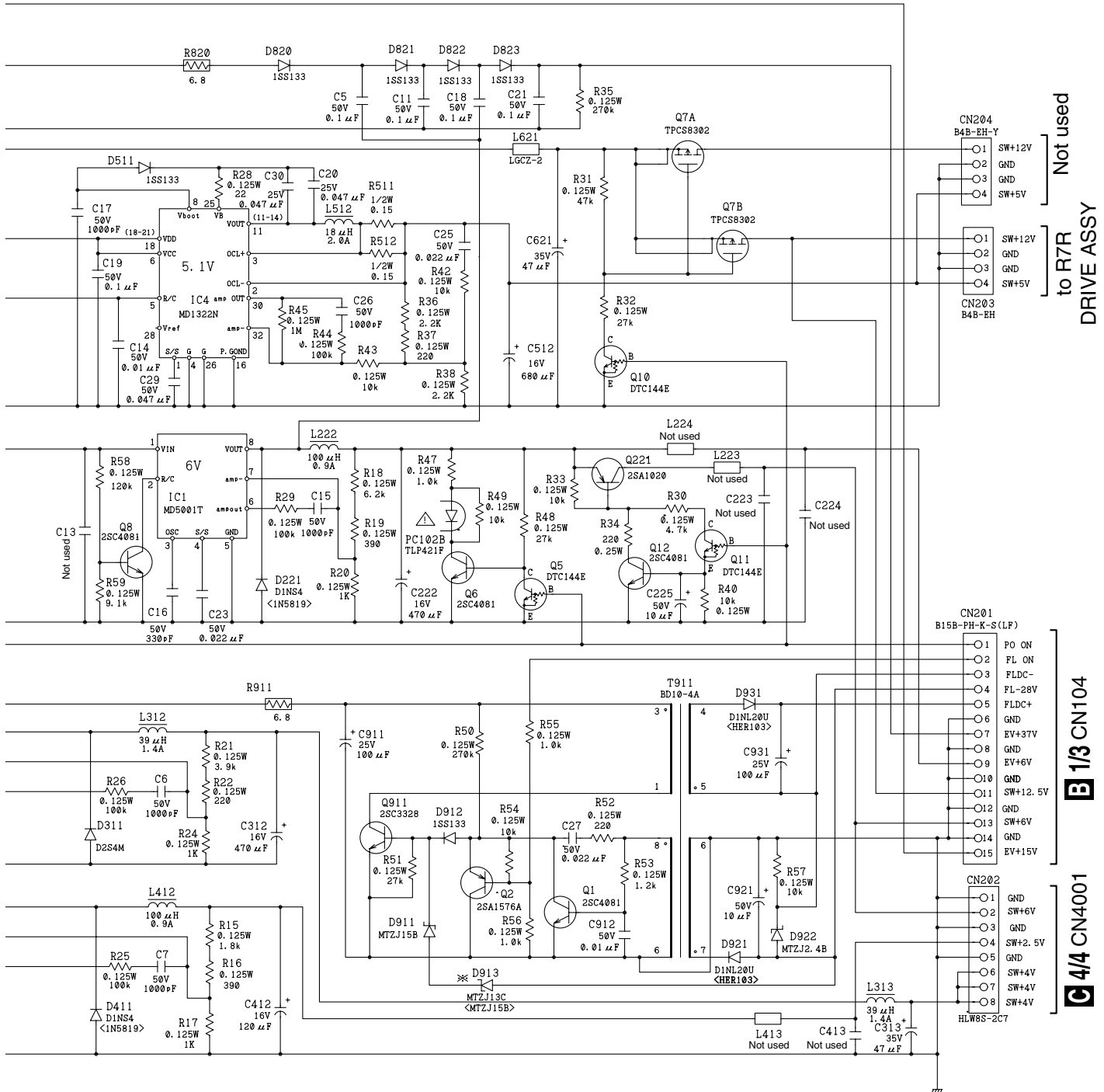


*** : STAND BY

3.13 POWER SUPPLY UNIT

POWER SUPPLY UNIT (VWR1381)



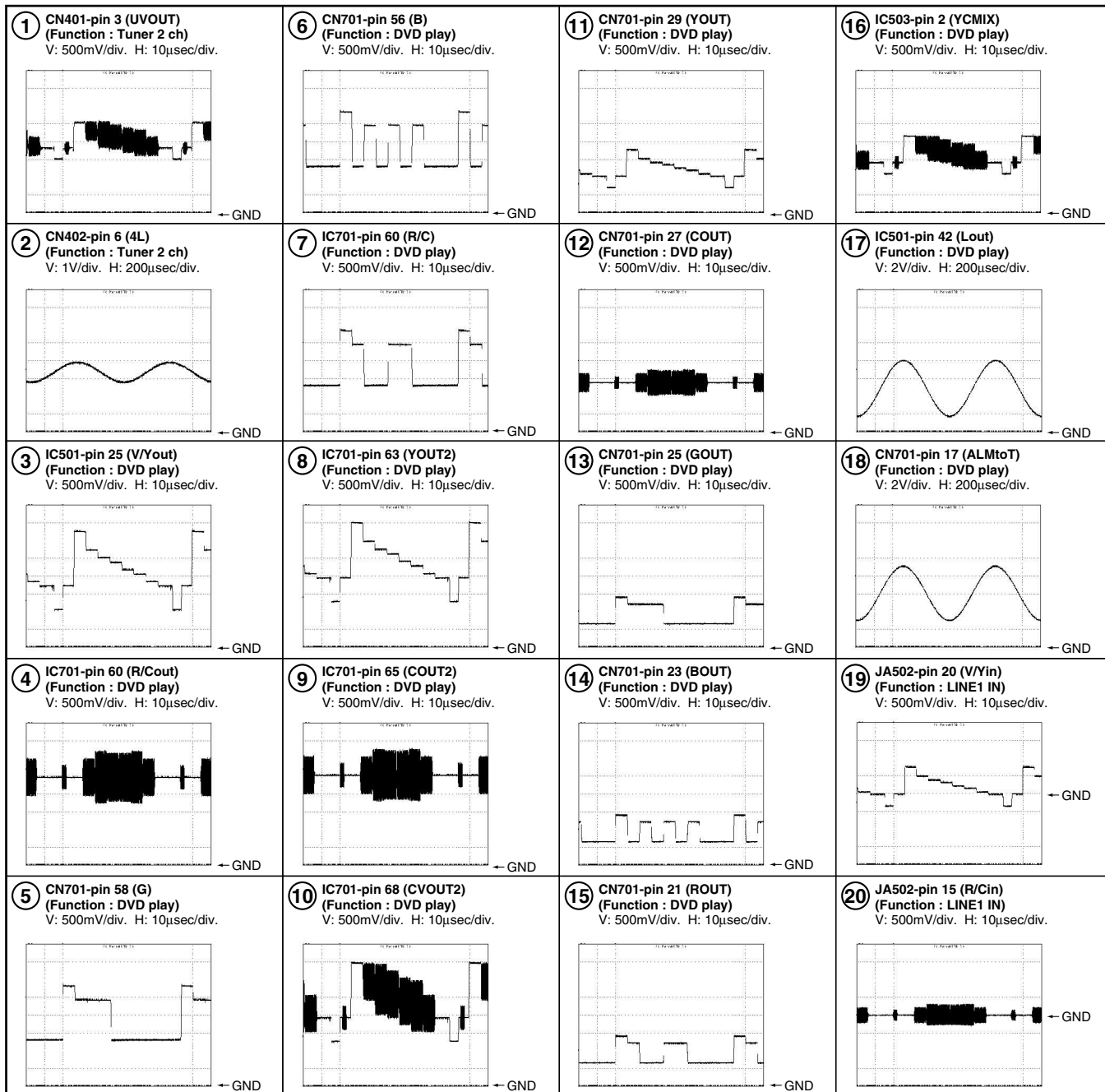


3.14 WAVEFORMS

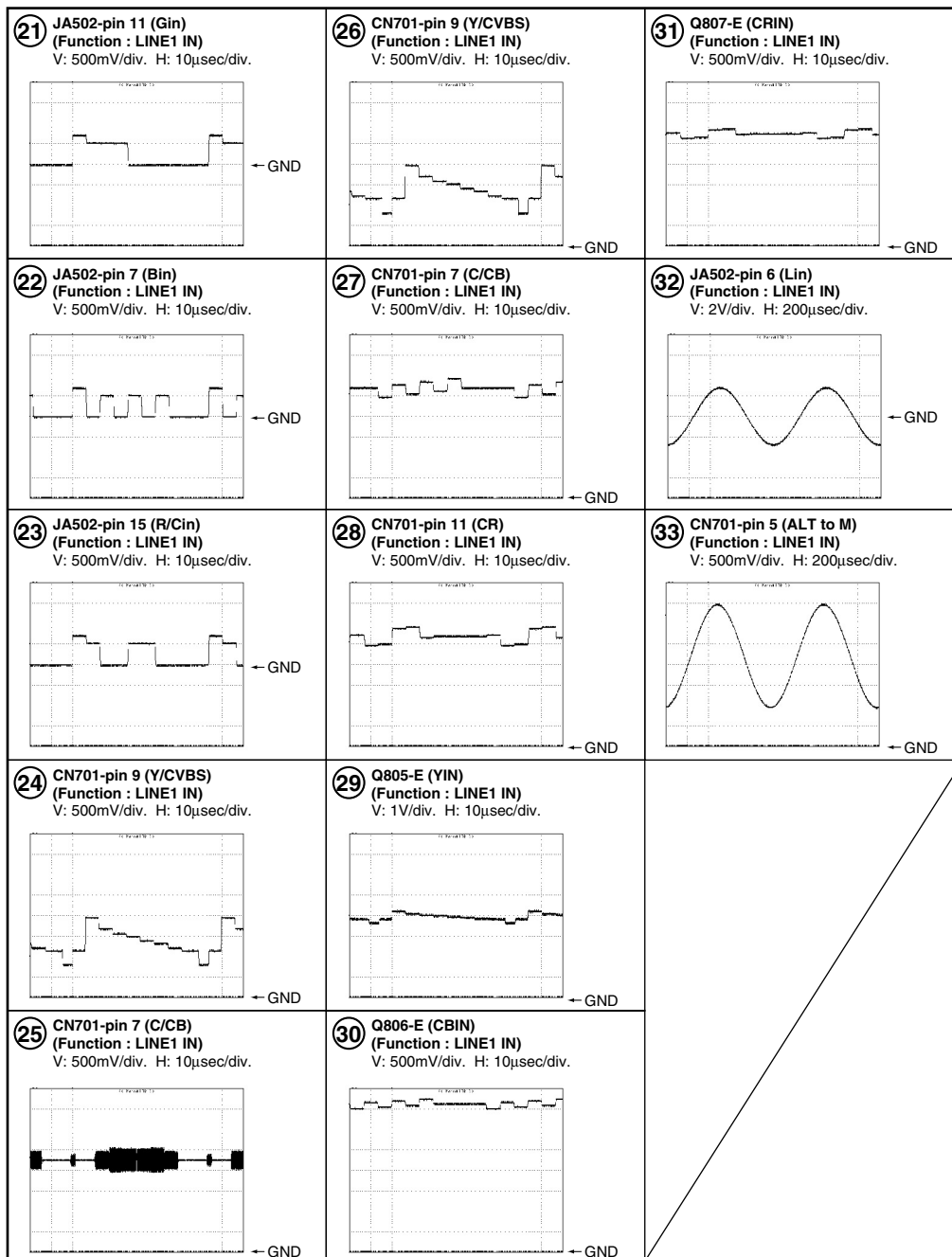
Note : The encircled numbers denote measuring point in the schematic diagram.

B JCKB ASSY

Measurement condition ;
 No.1, No.19 to No.31 : 75% Color-bar
 No.3, No.16 : 75% Color-bar, APX disc 1-24
 No.2, No.32, No.33 : 1kHz, 2Vrms
 No.17, No.18 : 1kHz, 2Vrms, APX disc 1-1



B JCKB ASSY



C MAIN ASSY

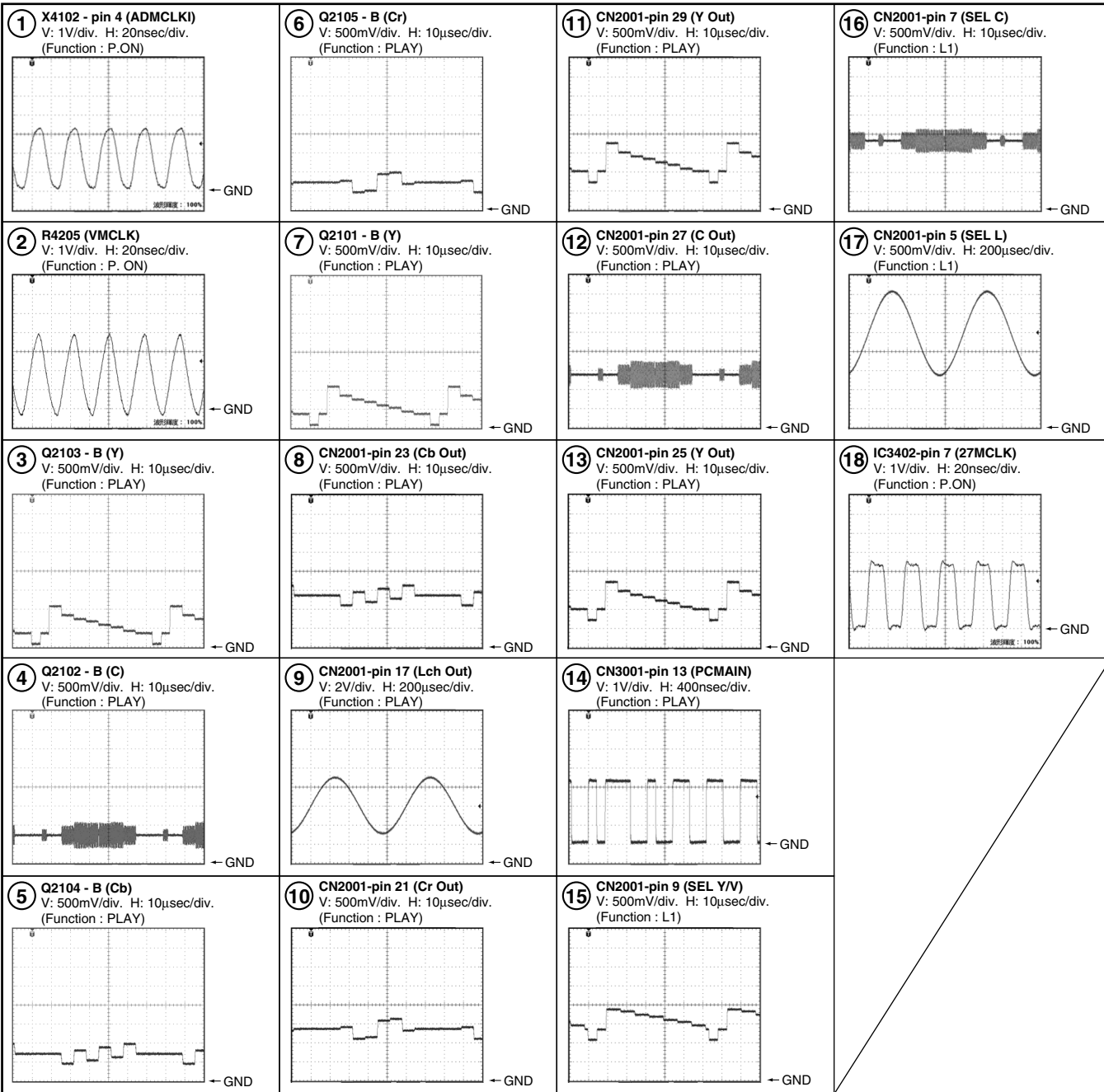
Measurement condition ;

No.3 to No.8, No.10 to No.13 : 75% Color-bar, A1 disc 2-20

No.15, No.16 : 75% Color-bar

No.9, No.14 : 1kHz, 2Vrms, A1 disc 2-1


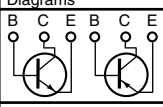

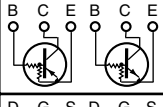

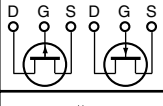

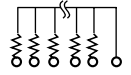


No.17 : 1kHz, 2Vrms



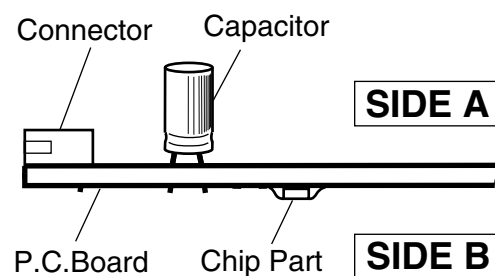
4. PCB CONNECTION DIAGRAM

NOTE FOR PCB DIAGRAMS :

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.
4. View point of PCB diagrams.



1 2 3 4

4.1 TUNB ASSY

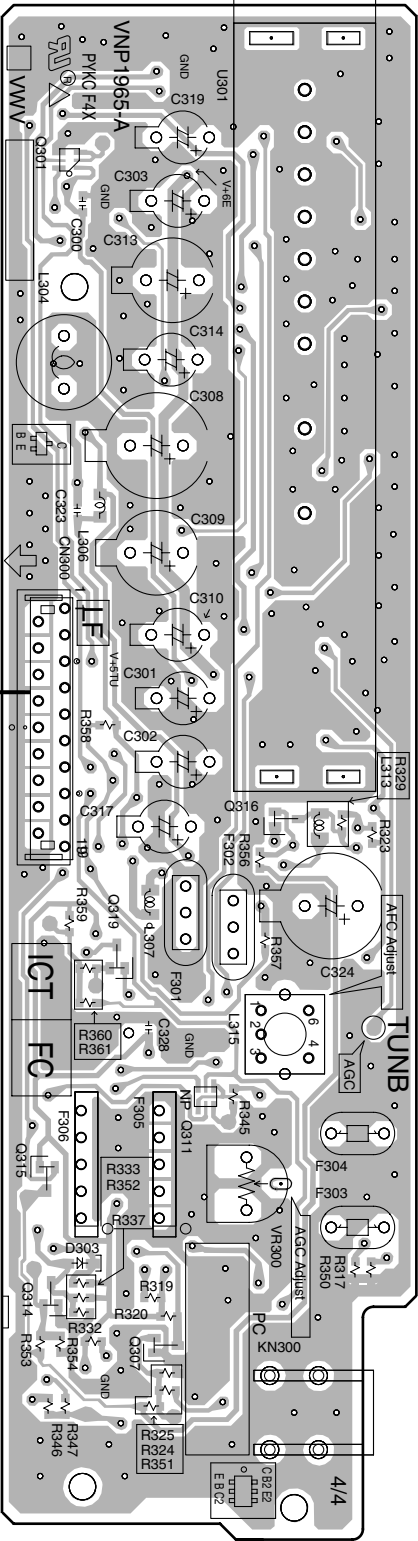
SIDE A

SIDE A

A TUNB ASSY

B CN401

CN300

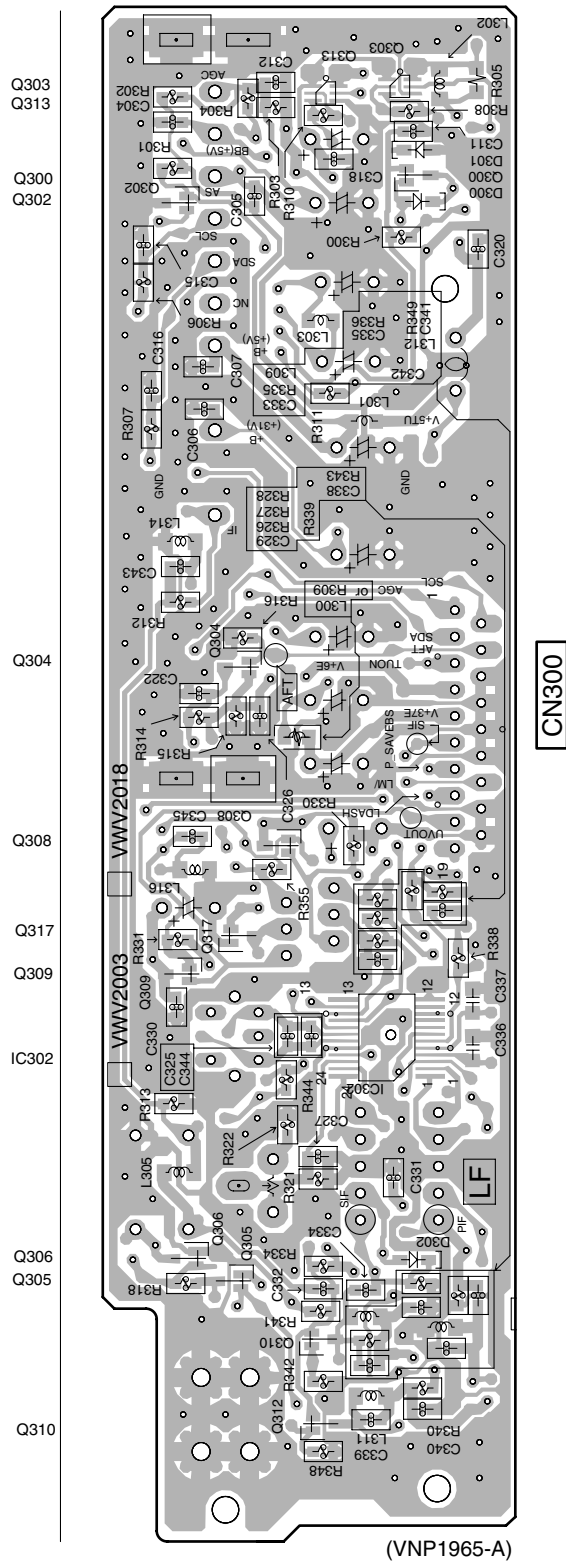


(VNP1965-A)

SIDE B

SIDE B

A TUNB ASSY



(VNP1965-A)

A

A

4.2 JCKB ASSY

SIDE A

B JCKB ASSY

for Downloading

Lithium Battery

CN1301

F

CN705

R7 DRIVE ASSY

D CN100C

DVR-220-S

A

1

C

□

E

1



SIDE B

A

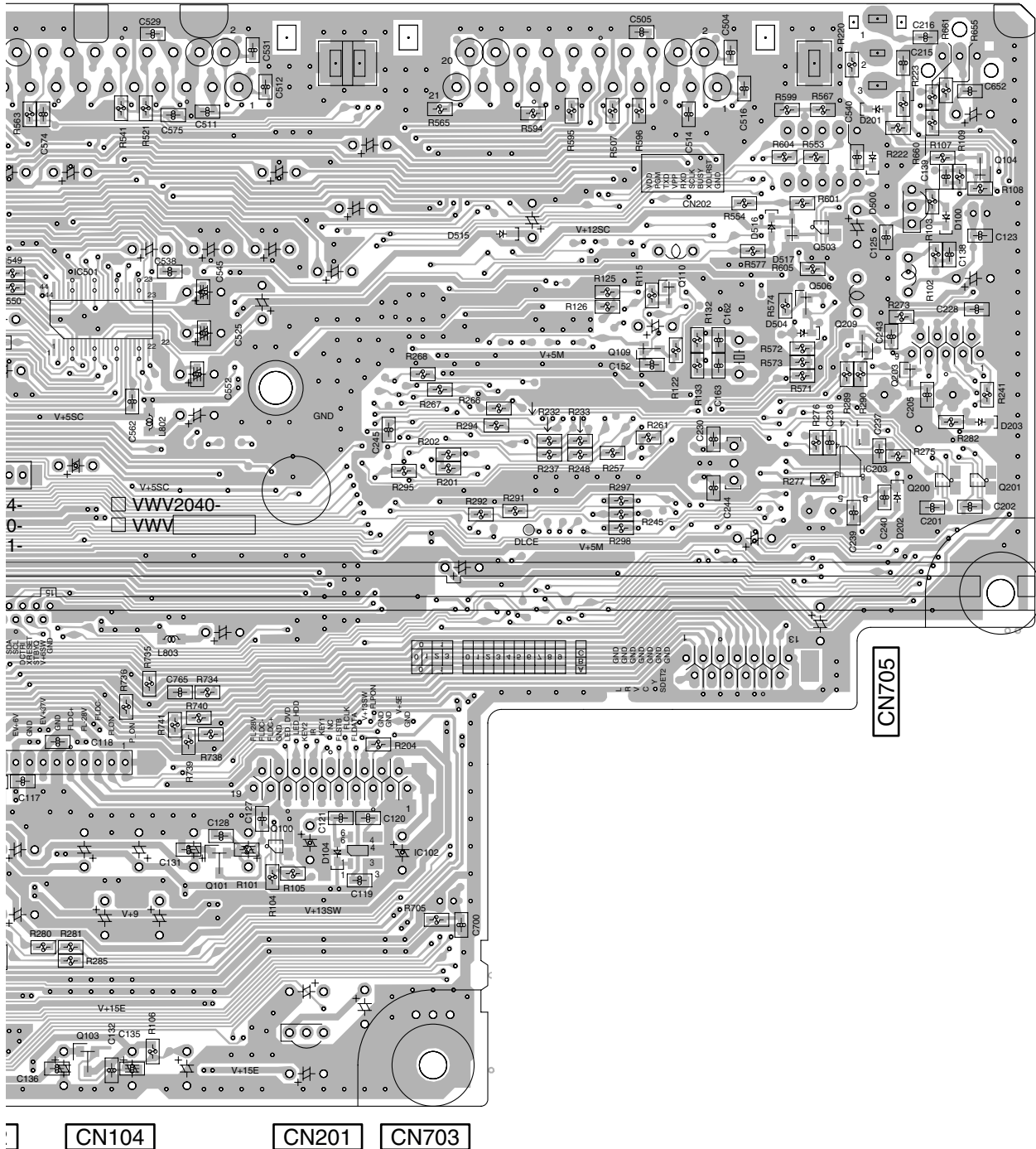
B

C

D

E

F



4.3 MAIN ASSY

SIDE A

C MAIN ASSY

IC4007

IC5101

Q1102

ICS202

IC4101

Q2105

Q2104

Q2311

Q2101

Q2102

Q2302

Q2312

Q2301

Q2103

IC5204

IC3301

Q2201

Q2222

Q2202

IC4008

Q2203

IC3403

IC3402

IC4206

IC4205

IC3101

IC4004

IC2331

IC2211

IC2301

Q2241

Q3201

Q3202

IC2302

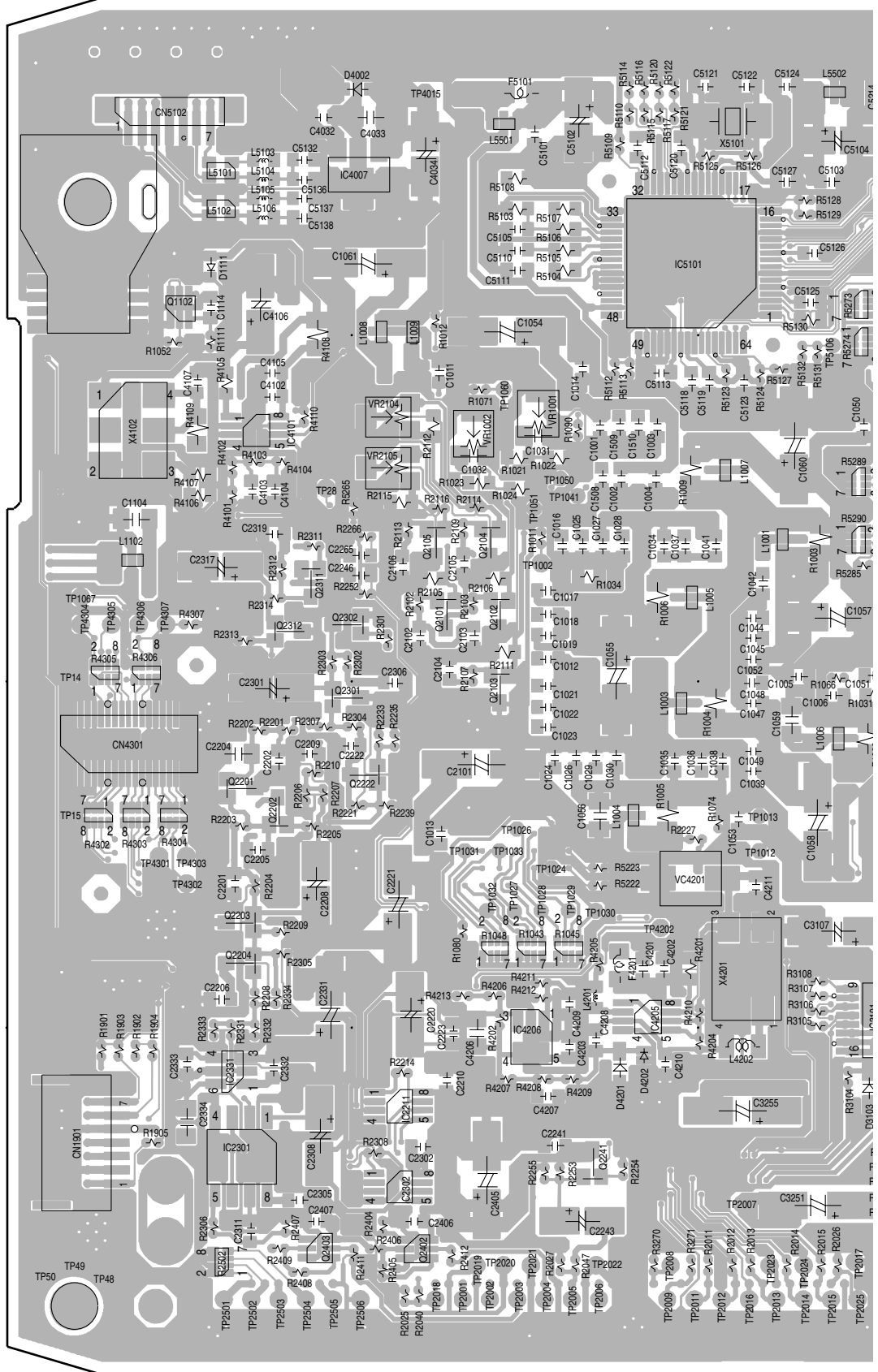
IC4003

IC3001

Q2403

Q2402

Q2001



SIDE B

C MAIN ASSY

A

B

C

D

E

F

IC1103
IC1104

IC1301

IC5301

IC5341

IC1421

IC1102

IC4006

IC5321

IC1001

IC5322

IC1401

IC5002

IC1101

IC3201

Q4000

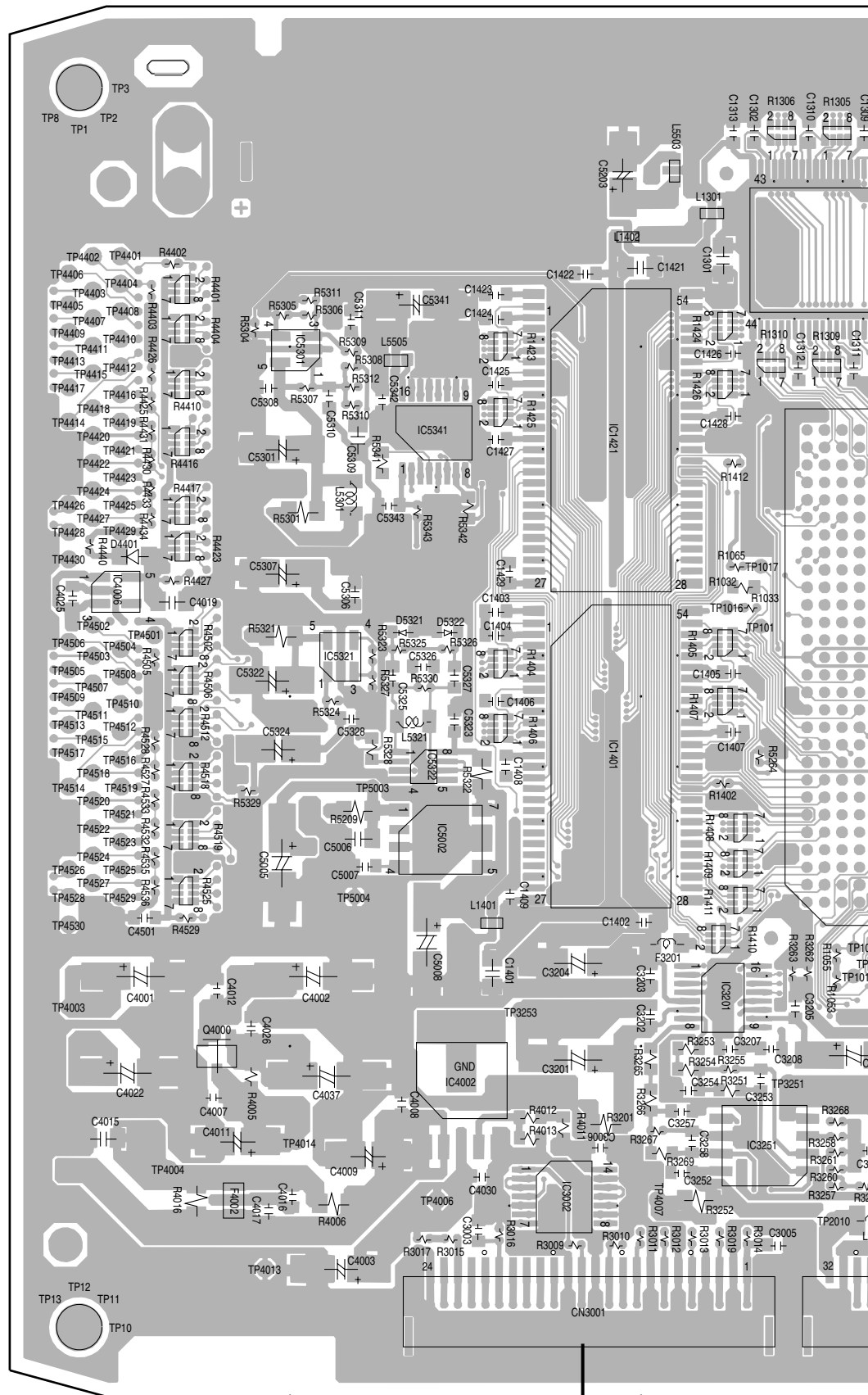
IC4002

IC1201

IC2501

IC3251

IC3002



CN3001

B CN702

DVR-220-S

SIDE B

F

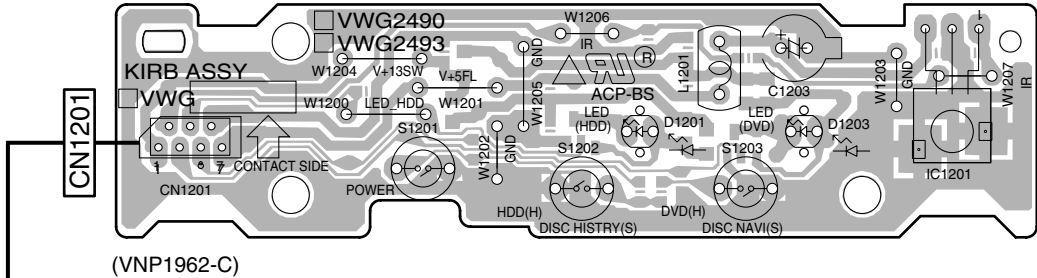


DVR-220-S

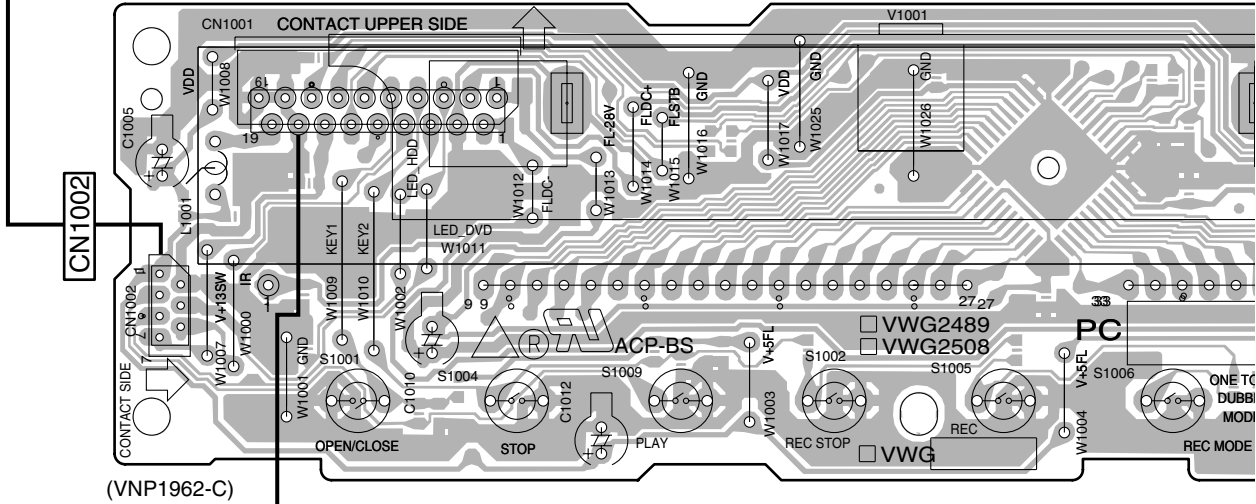
4.4 FLKY, KIRB and FRJB ASSYS

SIDE A

KIRB ASSY



FLKY ASSY



CN1001

CN201

DE

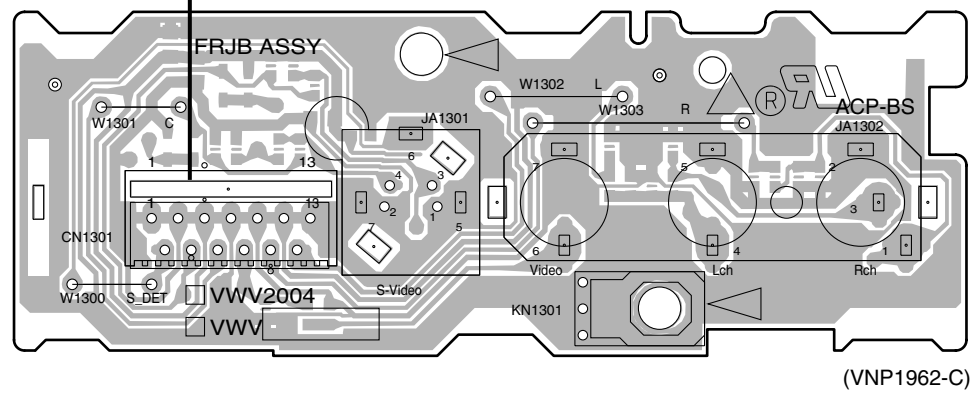
SIDE A

A

F FRJB ASSY

B CN705

CN1301



A

B



F

F

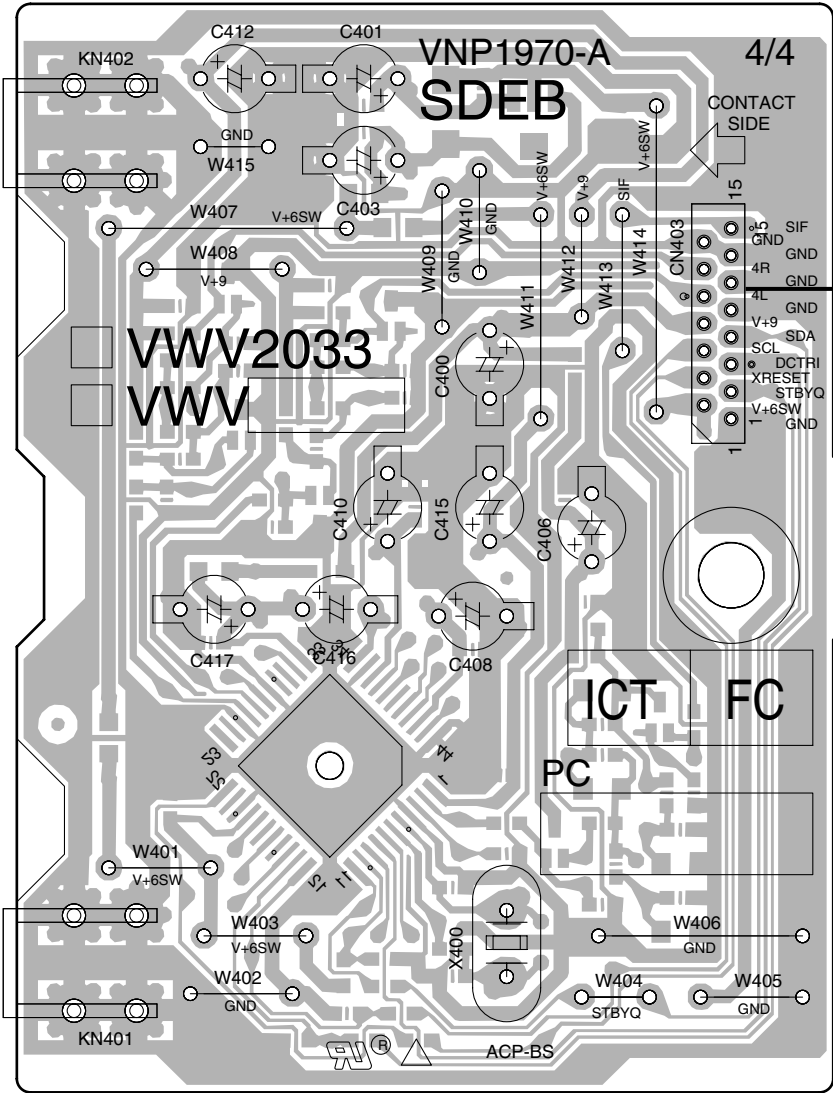
63

4.5 SDEB ASSY

SIDE A

SIDE A

G SDEB ASSY



(VNP1970-A)

SIDE B

SIDE B

G SDEB ASSY

Q400

Q406

Q401

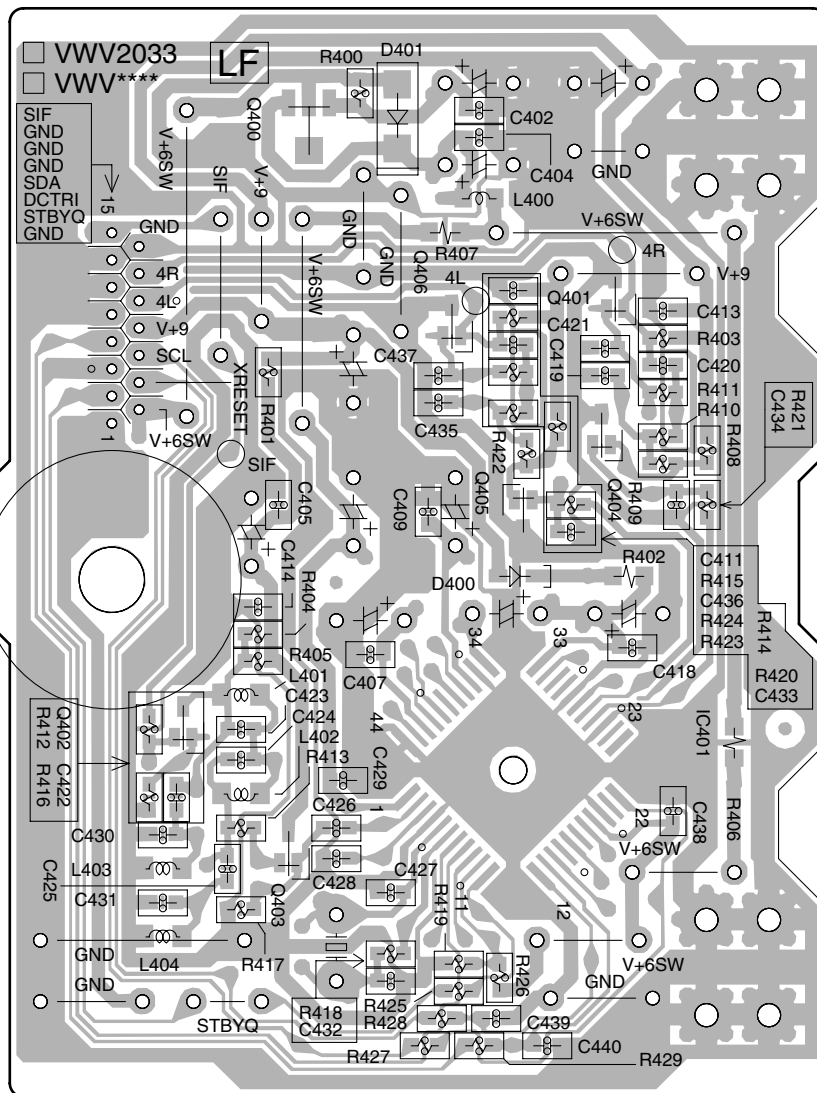
Q405 Q404

Q402

IC401

Q403

CN403



(VNP1970-A)

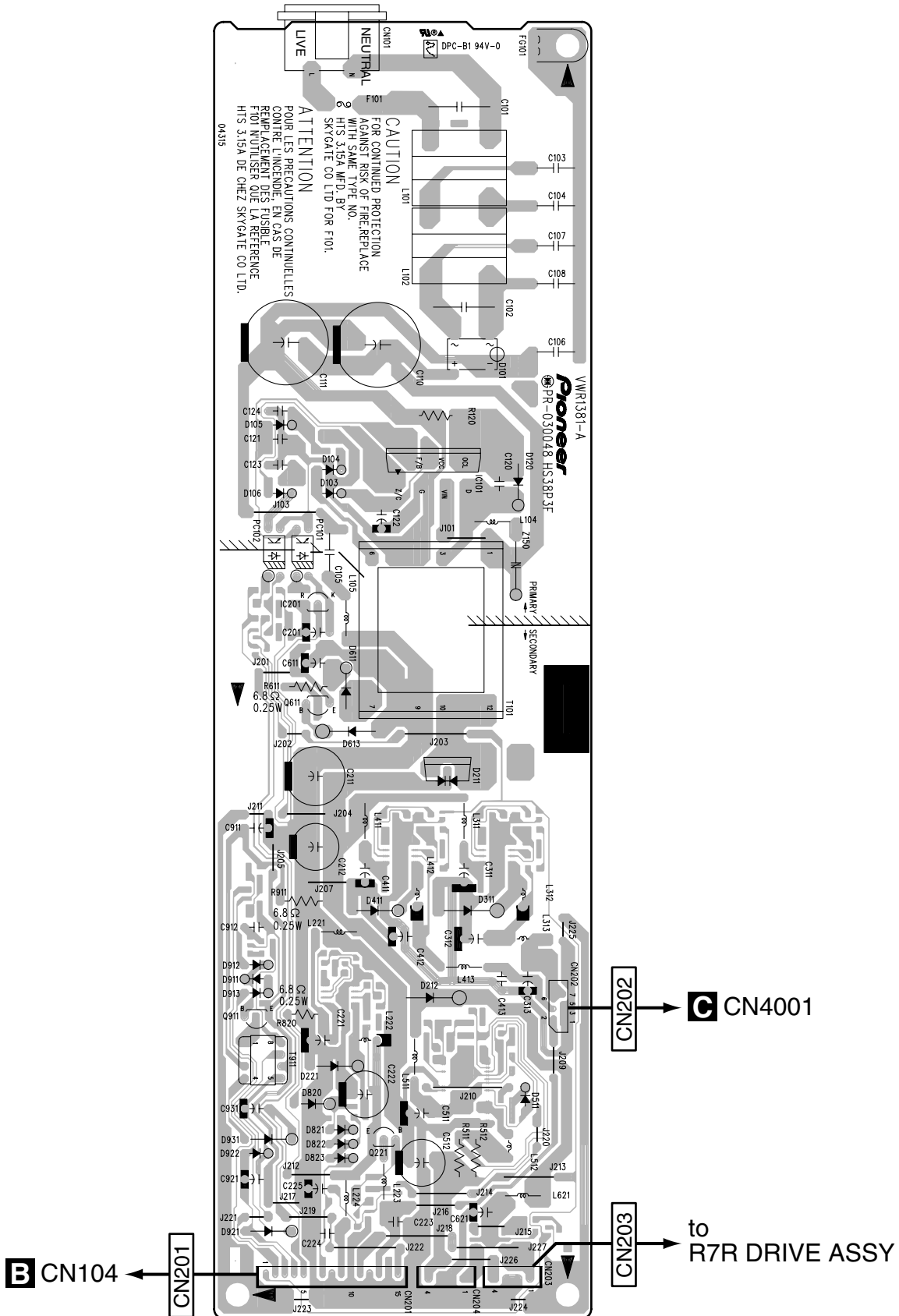


4.6 POWER SUPPLY UNIT

SIDE A

POWER SUPPLY UNIT

SIDE A



5. PCB PARTS LIST

NOTES: ●Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.

●The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

●When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10¹ → 561 RD1/4PU 561J
47k Ω → 47 × 10³ → 473 RD1/4PU 473J
0.5 Ω → R50 RN2H R50K
1 Ω → 1R0 RSIP 1R0K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 RN1/4PC 5621F

Mark No. Description Part No. LIST OF ASSEMBLIES

NSP	1..FLKB ASSY	VWM2254
	2..FLKY ASSY	VWG2489
	2..KIRB ASSY	VWG2490
	2..FRJBASSY	VWV2004
	1..TUNB ASSY	VWV2003
	1..MAIN ASSY	VWV2000
	1..JCKB ASSY	VWV2030
	1..SDEB ASSY	VWV2033
⚠	1..POWER SUPPLY UNIT	VWR1381

Mark No. Description Part No.

A TUNB ASSY SEMICONDUCTORS

IC302	TDA9818TS
Q302, Q308, Q319	2SA1576A
Q300, Q304, Q306, Q307	2SC4081
Q310, Q312	2SC4082
Q305, Q315	DTA124EUA
Q311	RN1903
Q301	RN4903
Q303, Q313	UMF21N
D300	1SS355
D302	1SS356
D301	UDZS33B

COILS AND FILTERS

L304 RADIAL INDUCTOR	ATH1109
L301, L303, L306 CHIP FERRITE BEAD	CTF1399
L316	LCKAW330J2520
L305	LCKAWR22J2520
L311, L314	LCKAWR47J2520
L307	LCYA150J2520
L309	LCYAR68J2520
F306 SAW FILTER	VTF1177
F305 SAW FILTER	VTF1179
F304 IF TRAP FILTER	VTF1180

Mark No. Description Part No.

F303 IF TRAP FILTER	VTF1181
F301 TRAP FILTER	VTF1183
L315 VCO COIL	VTL1164

CAPACITORS

C306	CCSRCH102J50
C333, C345	CCSRCH150J50
C339	CCSRCH220J50
C343	CCSRCH270J50
C315, C316	CCSRCH330J50
C325	CCSRCH7R0D50
C344	CCSRUJ4R0C50
C301	CEAT100M50
C308	CEAT102M6R3
C303	CEAT330M25
C313, C324	CEAT471M6R3
C336, C337	CKSQYB225K10
C332, C334, C335, C340, C341	CKSRYB102K50
C322, C323, C327	CKSRYB103K50
C329	CKSRYB104K16
C304, C305, C328, C331	CKSRYB222K50
C338	CKSRYB224K10
C307, C326, C330	CKSRYF104Z25
C311	CKSRYF104Z50

RESISTORS

R309	RS1/10S0R0J
R305	RS1/10S150J
VR300 (10K)	VCP1156
Other Resistors	RS1/16S###J

OTHERS

CN300 19P SOCKET	AKP7073
300 SCREW PLATE	VNE1948
U301 TV FRONT END	VXF1023

B JCKB ASSY SEMICONDUCTORS

IC504	BA4558F-HT
IC204	BR24L32F-W
IC801	LA7213
IC501	LA73026AV
IC701	LA73033M
IC702	LC75342M
IC806-IC808	MM1501XN
IC703	MM1504XN
IC503	MM1511XN
⚠ IC101	MM1565AF

Mark No. Description**Part No.****Mark No. Description****Part No.**

⚠ IC103
IC202
A ⚠ IC102
IC201
IC203

NJM78M09DL1A
PEG035B
PQ1K333M2ZP
PST3245
RS5C372A

C563, C564
C139, C547, C548, C814, C815
C162, C163, C230, C244
C770, C774, C778
C225, C231, C232, C713, C789

CCSRCH220J50
CCSRCH221J50
CCSRCH270J50
CCSRCH390J50
CCSRCH470J50

IC803
IC205
IC500, IC502
IC805
IC104

TA1287FG
TC74HCT7007AF
TC7W53FU
TC7WH123FU
TC7WU04FU

C791
C506–C509, C511, C512, C514
C516, C526, C527, C570, C571
C574, C575, C741, C742
C159

CCSRCH470J50
CCSRCH471J50
CCSRCH471J50
CCSRCH471J50
CCSRCH561J50

Q502, Q708–Q710, Q803
Q805–Q808
Q107
B Q102
Q106

2SA1576A
2SA1576A
2SA1577
2SB1238X
2SC1740S

C780
C215
C129, C130, C133, C134, C148
C164
C137

CCSRCH680J50
CCSRCH681J50
CEAL101M10
CEAL101M10
CEAL101M6R3

Q101, Q103
Q104, Q110, Q208, Q209
Q504–Q506
Q108
Q206

2SC2411K
2SC4081
2SC4081
2SC4097
2SD2114K

C150
C553, C554, C556, C557
C560, C561
C140, C157, C746–C749
C752–C757, C821–C823

CEAL220M16
CEANP100M16
CEANP100M16
CEAT100M50
CEAT100M50

Q109, Q203, Q205, Q804
Q112, Q204, Q207, Q801
Q702
Q111
C Q500, Q501, Q703

DTA124EUA
DTC124EUA
HN1B04FU
HN1C01FU
HN1C03FU

C826–C828
C107, C122, C200, C213, C235
C543, C651, C723, C731, C736
C767, C820, C829, C834
C124, C142, C144, C510, C539

CEAT100M50
CEAT101M10
CEAT101M10
CEAT101M10
CEAT101M16

Q202, Q515, Q516
Q507, Q509, Q511, Q705, Q802
Q105, Q200, Q201, Q503
Q513, Q514, Q704, Q707
Q100

RN1901
RN2903
RN4903
RN4903
UMF21N

C544, C739, C743, C830
C524, C537, C706–C708, C729
C737
C558
C517–C522, C533, C534

CEAT101M16
CEAT102M6R3
CEAT102M6R3
CEAT1R0M50
CEAT220M25

D101
D203
D102, D201, D205, D500, D504
D515, D705, D706
D200, D501–D503, D517

1SR154-400
1SS352
1SS355
1SS355
DAN217U

C542, C750, C751
C812
C738, C740
C126
C835

CEAT221M16
CEAT3R3M50
CEAT470M16
CEAT471M16
CEVW101M10

D206, D532, D534
D505–D514, D522–D529, D531
D707–D709
D104, D202, D516
D103

DAP202U
DF3A5.6FU
DF3A5.6FU
RB501V-40
UDZS12

C709
C549, C565
C110
C160, C224, C523, C538, C555
C559, C562, C567, C765

CEVW220M6R3
CKSQYB105K16
CKSQYB225K10
CKSRYB103K50
CKSRYB103K50

D652

UDZS5R1

C222, C223, C701, C703, C705
C710, C712, C714–C717
C719–C722, C724, C726, C727
C804–C806, C836–C838
C568, C781, C784

CKSRYB104K16
CKSRYB104K16
CKSRYB104K16
CKSRYB104K16
CKSRYB105K10

COILS AND FILTERS

L101
L701–L703
L704
L102
L801

LAU100J
LAU220J
LAU2R2J
LAU470J
LCYA220J2520

C109, C115, C116, C119–C121
C123, C125, C127, C128
C131, C132, C135, C136, C141
C143, C147, C149, C152
C154–C156, C158, C161

CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25

L100
L200 CHIP BEAD

LTA102J
VTL1081

C203, C204, C214, C216, C217
C229, C236, C243, C532
C540, C541, C550, C551, C569
C652, C728, C730, C744, C745
C766, C782, C783, C785–C788

CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25

SWITCHES AND RELAYS

RY500

VSR1017

CAPACITORS

C153, C239
C205, C226–C228, C718
C759–C761, C817, C819
C212, C504, C505, C529, C531
C771, C775, C779

CCSRCH100D50
CCSRCH101J50
CCSRCH101J50
CCSRCH102J50
CCSRCH180J50

C801, C807, C809, C813, C816
C818
C209–C211, C220, C221
C233, C234, C240, C525, C545
C552

CKSRYF104Z25
CKSRYF104Z25
CKSRYF105Z10
CKSRYF105Z10
CKSRYF105Z10

5		6		7		8	
Mark No.	Description	Part No.	Mark No.	Description	Part No.		
RESISTORS							
R578		RS1/10S75R0F	IC1102		VYW2179		
R831		RS1/16S1001F	IC1201		W986416DH-6		
R833, R841		RS1/16S1201F	Q2101-Q2105,Q2201,Q2203,Q2301		2SA1576A		A
R835		RS1/16S1801F	Q2312		2SA1576A		
R837, R839		RS1/16S2001F	Q4000		2SC2411K		
R842		RS1/16S2200F	Q2202,Q2222,Q2241		2SC4081		
R744, R747, R750		RS1/16S6800F	Q2302,Q2311		DTC114EUA		
R519, R542, R543, R548, R560		RS1/16S75R0F	Q2402,Q2403		HN1B04FU		
R565, R576, R594-R596		RS1/16S75R0F	Q3201,Q3202		RN1903		
R712, R713, R718, R734-R736		RS1/16S75R0F	Q1102		RN4982		
R752		RS1/16S75R0F	Q2001		UMF21N		
Other Resistors		RS1/16S###J	D3001,D3002,D3101-D3104		1SS355		
			D4201		MA2ZV05		
			D1111		RB521S-30		B
OTHERS			COILS AND FILTERS				
CN202 9P FFC CONNECTOR	52045-0945		F3102,F3401-F3403,F4201		DTF1069		
CN705 13P FFC CONNECTOR	52045-1345		CHIP BEAD				
CN201 19P FFC CONNECTOR	52045-1945		L1001-L1009,L1101,L1102,L1301		DTL1106		
CN401 19P PLUG	AKP7062		L1401 CHIP EMI FILTER		DTL1106		
CN104	B15B-PH-K		L4202		LCYA1R2J2520		
CN105, CN703 KR CONNECTOR	B2B-PH-K		F3201 CHIP SOLID INDUCTOR		VTF1096		
JA651 OPTICAL LINK OUT 8MB/S	JFJ1001		L2101 CHIP COIL		VTL1067		
JA200 REMOTE CONTROL JACK	RKN1004		L4201 CHIP BEAD		VTL1079		
BT200 LITHIUM BATTERY	VEM1034						
JA501, JA502 RGB CONNECTOR	VKB1157						
JA700 JACK	VKB1193		CAPACITORS				C
CN402 CONNECTOR	VKN1191		C3253,C3258		CCSRCH101J50		
CN702 CONNECTOR	VKN1200		C3207		CCSRCH331J50		
CN701 32P CONNECTOR	VKN1263		C4208		CCSRCH390J50		
ST200 BATTERY SOCKET	VKX1016		C3254,C3257		CCSRCH681J50		
			C2208,C2317,C4034		CEVW100M16		
KN701-KN703 WRAPPING TERMINAL	VNF1084		C3251,C3255,C4001,C4002,C4004		CEVW101M16		
X100 CRYSTAL RESONATOR	VSS1176		C4029,C4037		CEVW101M16		
(4.433619 MHz)			C2101,C2221,C2405,C3201,C3204		CEVW101M6R3		
X201 CRYSTAL RESONATOR	VSS1197		C3206		CEVW101M6R3		
(32 kHz)			C2301		CEVW220M6R3		
X200 CRYSTAL RESONATOR	VSS1202						
(10 MHz)			C1060,C1061,C4022		CEVW221M4		D
			C3106		CEVW2R2M50		
			C2308,C3102,C3107,C4003		CEVW470M6R3		
			C2220,C2243		CEVWNP100M10		
			C1031,C1032,C1503-C1506		CKSQYB104K16		
			C2204,C4206		CKSQYB105K10		
			C1901,C4014,C4019,C4033		CKSQYB225K10		
			C1004,C1012,C1014,C1029,C1034		CKSRYB102K50		
			C1040,C1044,C1049,C1051		CKSRYB102K50		
			C1110,C1111,C1207,C1208,C1307		CKSRYB102K50		
			C1311,C1313,C1407,C1408,C3408		CKSRYB102K50		E
			C1003,C1027,C1037,C1052,C1109		CKSRYB103K50		
			C1206,C1305,C1308,C1310,C1406		CKSRYB103K50		
			C2305,C3003,C3004,C4018,C4020		CKSRYB103K50		
			C4207		CKSRYB103K50		
			C1508-C1510,C2311,C4104		CKSRYB104K16		
			C4103		CKSRYB223K50		
			C2202		CKSRYB563K16		
			C1002,C1005,C1007-C1010,C1016		CKSRYF104Z25		
			C1018,C1019,C1021-C1023		CKSRYF104Z25		
			C1025,C1026,C1028,C1030,C1035		CKSRYF104Z25		
			C1038,C1041,C1042,C1047,C1102		CKSRYF104Z25		F
			C1105,C1106,C1114,C1202,C1204		CKSRYF104Z25		
			C1302,C1304,C1312,C1402,C1404		CKSRYF104Z25		
			C2102-C2106,C2201,C2206,C2210		CKSRYF104Z25		
MAIN ASSY SEMICONDUCTORS							
IC3101	AK5381VT						
IC2301	BA7655AF						
IC1101	K4S281632E-TC75						
IC1401	K4S561632E-TC75						
IC1001	M65673WG-A						
IC4007	MM1603DP						
IC1301	MT48LC4M32B2TG-7						
IC4004,IC4006	NJM2872F05						
IC4206	NJU7013F						
IC3201	PCM1742KE						
IC4008	PQ015YZ01ZP						
IC4002	PQ070XZ02ZP						
IC4003	PST3428U						
IC4005	PST3809U						
IC3402	SM8707KV						
IC2211,IC2302	SN74AHC2G53HDCT						
IC3001	TC74LCX541FT						
IC3002	TC74VHC14FT						
IC3403,IC4205	TC7WHU04FU						
IC3251	UPC4570G2						

Mark No. Description**Part No.****Mark No. Description****Part No.**

C2222,C2241,C2302,C2306,C2319
C2406,C2407,C3006,C3101,C3105
C3108,C3202,C3203,C3205,C3252
C3256,C4006-C4008,C4010
C4012,C4013,C4017,C4021

CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25

C4024-C4026,C4032,C4202,C4203
C4209
C1001,C1006,C1048,C1103,C1107
C1203,C1205,C1209,C1303,C1306
C1309,C1403,C1405,C1409,C3001

CKSRYF104Z25
CKSRYF104Z25
CKSRYF105Z10
CKSRYF105Z10
CKSRYF105Z10

C3404-C3407,C4027,C4030,C4107
C4201,C4401,C4501
C4028 (4.7uF/6.3V)
C3402,C3403,C4015 (10uF)
VC4201 (10pF)

CKSRYF105Z10
CKSRYF105Z10
DCH1200
VCG1045
VCM1012

RESISTORS

R1025,R1026,R1042-R1046
R1048-R1051,R1054,R1068,R1069
R1072,R1073,R5218-R5221
R5229,R5230,R5289,R5290
R1408-R1411

RAB4CQ103J
RAB4CQ103J
RAB4CQ103J
RAB4CQ103J
RAB4CQ220J

R4401,R4404,R4410,R4416,R4417
R4423,R4502,R4506,R4512
R4518,R4519,R4525
R1114-R1117,R4405-R4408,R4436
R1303-R1310,R1404-R1407

RAB4CQ223J
RAB4CQ223J
RAB4CQ223J
RAB4CQ330J
RAB4CQ560J

R1203-R1206
R1207,R1502,R1507,R2017,R3002
R3102,R3201,R3252,R4001,R4006
R4009,R4014,R4016,R4109
R4019

RAB4CQ680J
RS1/10S0R0J
RS1/10S0R0J
RS1/10S0R0J
RS1/10S1001D

R1501
R4020
R4013
R3254,R3266
R4012

RS1/10S2202F
RS1/10S5600D
RS1/16S1001F
RS1/16S1002F
RS1/16S1200F

R3253,R3265
R4011
R1021,R1023
R3251,R3269
R2105,R2106,R2111,R2112,R2115

RS1/16S1201F
RS1/16S1501F
RS1/16S2201F
RS1/16S2202F
RS1/16S3300F

R4018
Other Resistors

RS1/16S3600D
RS1/16S###J

OTHERS

CN4401 40P FFC CONNECTOR
CN1901 7P FFC CONNECTOR
CN4001 8P FFC CONNECTOR
CN3001 24P FFC CONNECTOR
CN2001 32P FFC CONNECTOR

VKN1811
VKN1812
VKN1813
VKN1814
VKN1815

KN3 EARTH METAL FITTONG
X4201 CRYSTAL RESONATOR
(27.000 MHz)
X4102 VCXO (27 MHz)

VNF1109
VSS1146
VSS1195

**FLKY ASSY
SEMICONDUCTORS**

IC1001

PT6315

COILS AND FILTERS

L1001

LAU220J

SWITCHES AND RELAYS

S1001,S1002,S1004-S1009

VSG1024

CAPACITORS

C1012
C1010
C1001-C1004,C1020
C1006,C1009,C1013
C1011

CEJQ101M6R3
CEJQ220M35
CKSRYB103K50
CKSRYF104Z25
CKSRYF105Z10

RESISTORS

All Resistors

RS1/16S###J

OTHERS

CN1001 19P FFC CONNECTOR
V1001 FL TUBE
CN1002 CONNECTOR
FL HOLDER

9607S-19F
VAW1081
VKN1183
VNF1129

KIRB ASSY**SWITCHES AND RELAYS**

S1201-S1203

VSG1024

CAPACITORS

C1204

CKSRYF104Z25

RESISTORS

All Resistors

RS1/16S###J

OTHERS

IC1201 REMOTE RECEIVER UNIT
CN1201 CONNECTOR

RPM7140-H9
VKN1183

FRJB ASSY**CAPACITORS**

C1308,C1309

CCSRCH471J50

RESISTORS

R1501,R1502
Other Resistors

RS1/10S0R0J
RS1/16S###J

OTHERS

CN1301 FFC CONNECTOR 13P
JA1301 YC CONNECTOR(VERTI)
JA1302 3P JACK(VERTICAL)
KN1301 WRAPPING TERMINAL

52492-1320
VKB1190
VKB1206
VNF1084

SDEB ASSY**SEMICONDUCTORS**

IC401
Q401, Q404-Q406
Q402, Q403
D401
D400

MSP3417G
2SA1576A
2SC4081
1SR154-400
1SS355

COILS AND FILTERS

L400 CHIP FERRITE BEAD
L402, L403
L404
L401

CTF1399
LCYA150J2520
LCYA4R7J2520
LCYA8R2J2520

	5		6		7		8	
Mark No.	Description	Part No.						
<u>CAPACITORS</u>								
	C421, C429, C433, C434, C437	CCSRCH102J50						A
	C424	CCSRCH121J50						
	C431	CCSRCH181J50						
	C439, C440	CCSRCH220J50						
	C423	CCSRCH470J50						
	C426, C428	CCSRCH560J50						
	C430	CCSRCH680J50						
	C427, C432	CCSRCJ3R0C50						
	C408, C416	CEAT100M50						
	C403, C415, C417	CEAT101M10						
	C400, C406, C412	CEAT101M16						
	C410	CEAT3R3M50						
	C414, C420, C436	CKSRYB103K50						B
	C419, C435	CKSRYB472K50						
	C404, C405, C407, C409, C411	CKSRYF104Z25						
	C413, C418, C422, C425	CKSRYF104Z25						
	C438	CKSRYF105Z10						
<u>RESISTORS</u>								
	R406, R407	RS1/10S0R0J						
	R402	RS1/10S100J						
	Other Resistors	RS1/16S###J						
<u>OTHERS</u>								
	CN403 CONNECTOR	VKN1191						C
	401, 402 SCREW PLATE	VNE1948						
	X400 CERAMIC RESONATOR (18.432 MHz)	VSS1189						

H POWER SUPPLY UNIT
POWER SUPPLY UNIT has no service part.

6. ADJUSTMENT

6.1 TUNB ASSY ADJUSTMENT



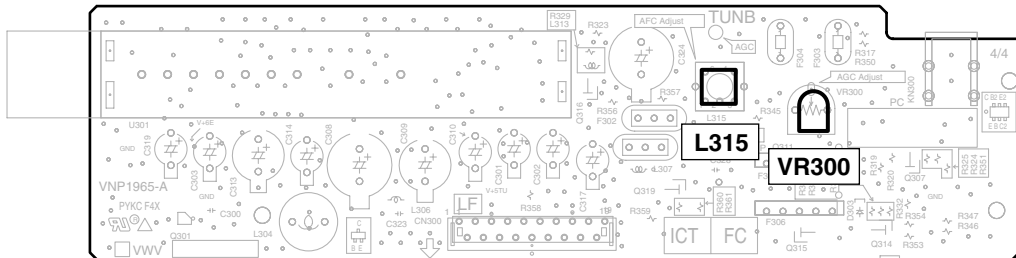
* It is not necessary to adjust the ASSY normally when exchanging the ASSY. But the adjustment is necessary when exchanging the Tuner Module and IC302 VIF/SIF IC.

No.	Adjustment Name	Adj. Point	Measurement Point	Adjustment Value	Adjustment State
1	VCO freerun frequency (AFC voltage) adjustment	L315	The solder land named "AFT" (upper side of JCKB ASSY)	1.90V ± 0.20V Note1	Terrestrial tuner input /through output. Any channel, RF Input ≥ 60dBu System = B/G, I or D/K AFT = OFF Note1
2	AGC start point adjustment	VR300	The solder land named "AGC" (upper side of JCKB ASSY)	3.80V ± 0.20V	Terrestrial tuner input Ch = E9(203.25MHz), Video= Blackburst RF Input = 60.0 ± 1.0dBu System = B/G, I or D/K

Note 1 : The adjustment spec. is defined without the thermal drift after the power on.
Therefore, start the adjustment at least 10 minutes after the power on.

A TUNB ASSY

SIDE A



6.2 MAIN ASSY ADJUSTMENT

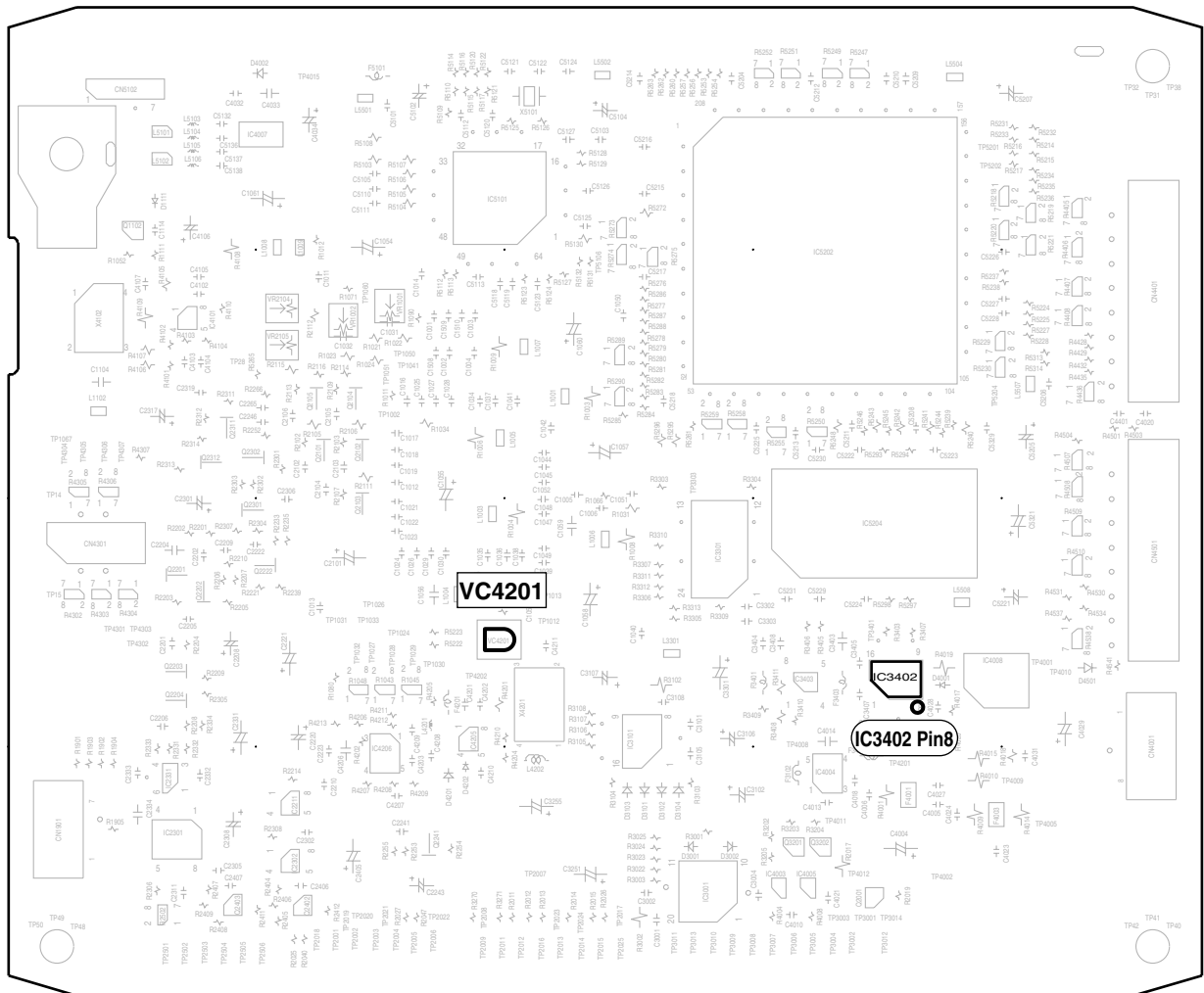


* It is not necessary to adjust the ASSY normally when exchanging the ASSY, but confirm the data.

No.	Adjustment Name	Adj. Point	Measurement Point	Adjustment Value	Adjustment State
1	Master clock free-running adjustment (Clock system adjustment)	VC4201	MAIN ASSY IC3402 Pin8 (XTO) (SM8707KV)	27.000000MHZ ± 130Hz	No signal input

C MAIN ASSY

SIDE A



1234

7. GENERAL INFORMATION

7.1 DIAGNOSIS

A

■ Service Diagnosis List

7.1.1

CPRM ID NUMBER AND DATA SETTING

The Setting is necessary

- " CPRM ERR" is displayed on the FL display immediately after the power is turned on or in Stop mode.
- When the MAIN ASSY , DRIVE ASSY or the FLASH ROM is exchanged.

7.1.2

MODEL SETTING

7.1.3

DOWNLOAD METHOD

The Setting is necessary

- When the MAIN ASSY is replaced.
- When the JCKB ASSY is replaced.
- When the MAIN ASSY and JCKB ASSY is replaced.

7.1.4

SERVICE MODE

[First Screen] (Version information, etc)

[Sub Screen] (Result of error-rate measurement : Video mode/VR mode)

[Second Screen] (ATA/ATAPI debug screen)

[Sub Screen 3] (writer maintenance information of ATA/ATAPI DEBUG OSD)

[Sub Screen 4] (ATA/ATAPI DEBUG OSD_LD degradation judgement)

[Fourth Screen] (VR-recording error log)

[Sub Screen 4] (Error log for VR recording)

[Fifth Screen] (Error log for VR playback)

[Sub Screen 2] (Error log for VR playback)

7.1.5

ERROR RATE MEASUREMENT

Only Video mode measurement

7.1.6

VIDEO ADJUSTMENT FOR SPECIFIC AREA

Purposes:

Depending on the area, jitter may appear in a picture received by the tuner, as conditions of signals received by the tuner are different from area to area. To correct this kind of problem, the function of the System Codec AVIO control section for adjusting signals received by the tuner can be used.

7.1.7

AGING MODE

Entering the ID Number and ID Data for DVD Recorder

For the DVD recorder, it is necessary with the recoding/playback of DVD-RW disc to set an individual number (ID number) and ID data to each recorder. If the number and data are not set correctly with the following procedure, operations in the future may not be guaranteed. You will find the ID number to be set on the ID label on the rear panel.

Important: If no ID label is found on the rear panel, write down the specified ID number by checking it according to "How to confirm the ID number" shown below.

The Input is Necessary When:

- " CPRM ERR" is displayed on the FL display immediately after the power is turned on or in Stop mode.
- When the MAIN ASSY , DRIVE ASSY or the FLASH ROM is exchanged.

Note:

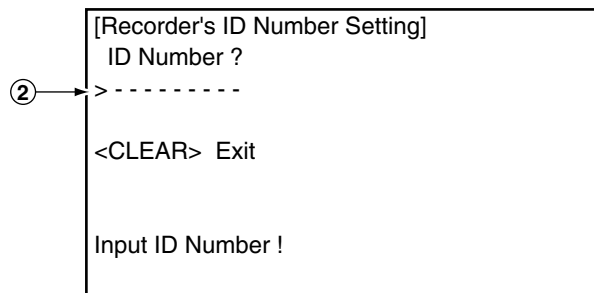
Be sure to enter the ID number in Stop mode.
Use the service remote control (GGF1381) for operations. Only opening/closing of the tray are performed from the player.
The ID data disc is swept out automatically after the recorder have read the data from it.

How to Input the ID Number and ID Data

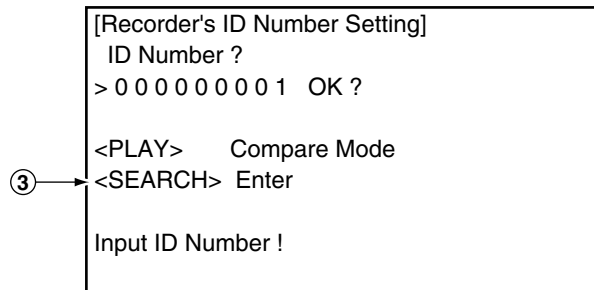
- To enter the input mode, press **[ESC]+[STEREO]** sequentially in a status with no ID number set, such as after FLASH-ROM downloading.



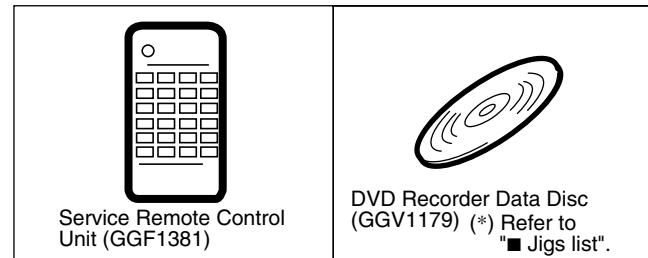
- As number input is enabled when the unit enters the input mode, input the 9-digit ID number.
(The entered number is also displayed on the FL display.)



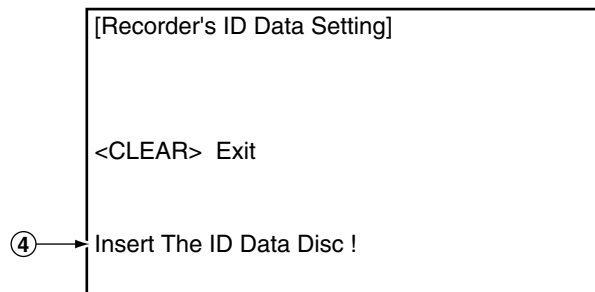
- After inputting the number, press **[SEARCH]** to register the ID number.



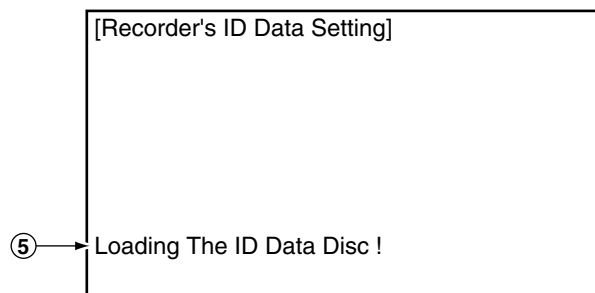
JIGS AND MEASURING INSTRUMENTS



- When the ID number has been registered, the unit enters the ID data input mode. (The FL display indicates "INSERT ID.") In this condition, place the ID data disc on the tray and close the tray using the CLOSE key **[■/▲]** on the player.



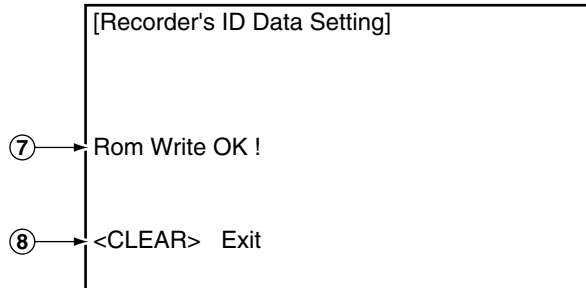
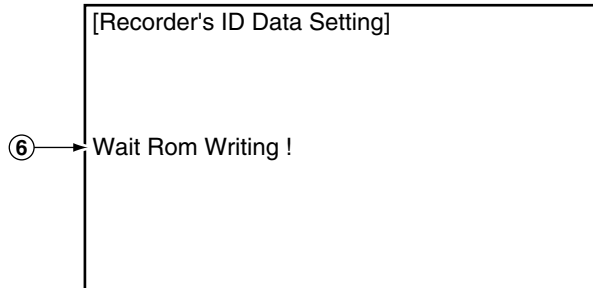
- While the data are being read, the message shown in the figure at left is displayed on the screen.
(The FL display indicates "LOAD ID.")



- ⑥ When the ID data have been read, the data are written to the FLASH-ROM.
(The FL display indicates "WRITE ID.")

- ⑦ When the ID data have been written to the FLASH-ROM, the message "Rom Write OK" is displayed on the screen.
(The FL display indicates "ID DATA OK.")

- ⑧ After confirming this message, press **CLEAR** to exit the input mode.

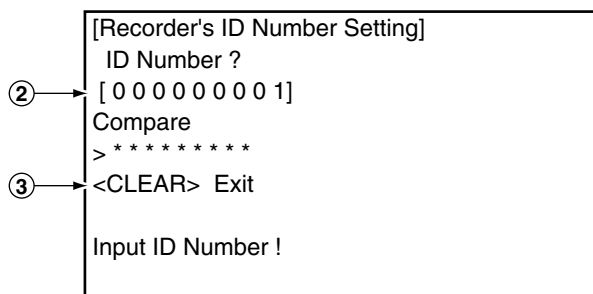


How to Confirm the ID Number

- ① Press **ESC** + **STEREO** sequentially with an ID number already set, and the unit enters the ID number confirmation mode.

- ② The set ID number is displayed on the screen (and on the FL display), permitting you to confirm it.

- ③ To exit this mode, press **CLEAR**.

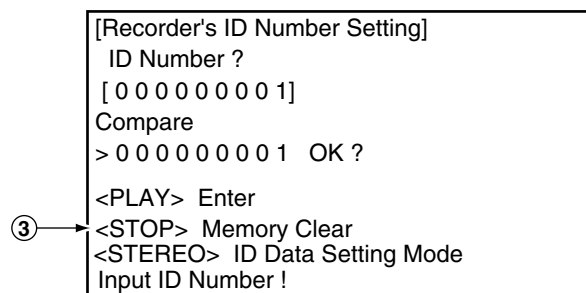
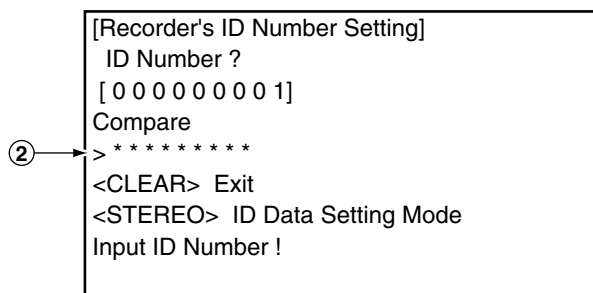


How to Clear the ID Number

- ① Press **ESC** + **STEREO** sequentially with an ID number already set, and the unit enters the ID number confirmation mode.

- ② Input the same number as the ID number you have set.

- ③ After inputting the number, press **STOP**.
Only when the entered number matches the set ID number, the ID number is cleared and the unit exits this mode.
If the numbers do not match, you must return to step 2.
(**STOP** is not accepted until 9 digits are entered.)



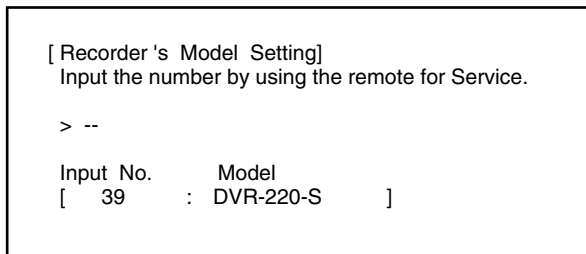
• The Setup is Necessary When :

- When the MAIN Assy is replaced
- When the JCKB Assy is replaced
- When the MAIN Assy and JCKB Assy are replaced

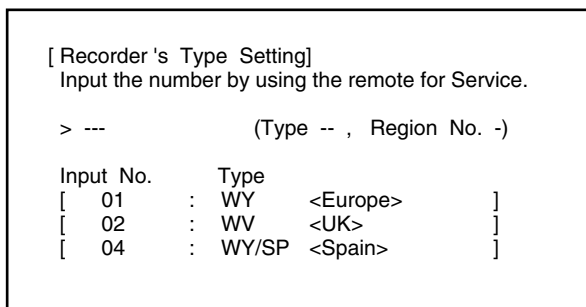
Note : Make sure of setting the correct number.

• How to Setup the Model

- After power on, the following screen is displayed on TV monitor.
Press " 39 " for DVR-220-S by using the remote control unit for service(GGF1381).

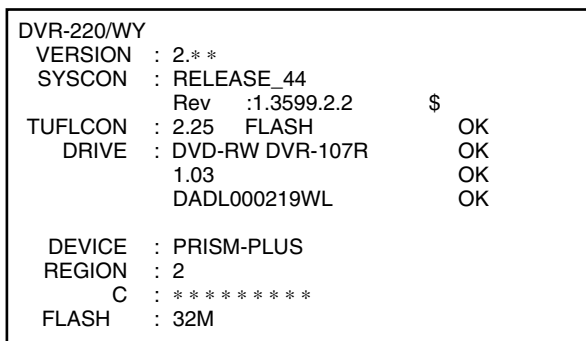


- After 1), the following screen is displayed on TV monitor.
Press " 012 " by using the remote control unit for service.



The setting complete when OSD is disappeared.

- Unplug the power cable.
- Reset the recorder to all its factory settings.
 - Make sure that the recorder is on.
 - Press and hold [STOP] and press [STANDBY/ON] key on the front panel.
The recorder turns off with all settings reset.
- Enter the Service Mode and then confirm the Model Name " DVR-220/KU/CA ".
 - Make sure that the recorder is on.
 - Press [ESC] then [DISP] keys by using the remote control unit for Service.



Notes :

- After the setting complete, you can NOT CLEAR the setting data.
Make sure the pressing number.
- " NG " is appeared on TV when unsuitable number is pressed.
In such a case, please unplug the power cable and plug it again. Then restart the model setting.

7.1.3 DOWNLOAD

• The Download is Necessary When :

- a) After model setting
- b) When "NG" is displayed at First screen (version information, etc)

[Notes]

Be sure NOT to turn off the unit during downloading.

If the unit is turned off during downloading, the SYSCON, TUFLCON, and DRIVE programs may not be properly rewritten, in which case the unit may not be able to initialize itself normally when turned on again. If that happens, repair the unit, as described below, then perform downloading again:

- In a case where the power to the unit was shut off during rewriting of the SYSCON program:
The SYSCON program will not function properly if the power to the unit is forcibly shut off while the message "DOWNLOAD-1" is displayed on the FL display during downloading. If downloading of the programs from the disc or through serial communication becomes impossible, replace the FLASH ROM.
- In a case where the power to the unit was shut off during rewriting of the DRIVE program:
The DRIVE program will not function properly if the power to the unit is forcibly shut off while the message "DOWNLOAD-2" is displayed on the FL display during downloading. If downloading of the programs from the disc or through serial communication becomes impossible, replace the DRIVE ASSY.
- In a case where the power to the unit was shut off during rewriting of the TUFLCON program (only for the flash-type TUFLCON microcomputers):
The TUFLCON program will not function properly if the power to the unit is forcibly shut off while the message "DOWNLOAD-3" is displayed on the FL display during downloading. If downloading of the programs from the disc or through serial communication becomes impossible, replace the TUFLCON microcomputer.

1. DISC DOWNLOAD METHOD

• How to Download

This is disc download method to save the initial setting data and user setting data.

However, the following data is deleted after downloading by this method.

- * REC mode
- * Last channel (Before turn unit off)

- 1) Open a disc tray in the " DVD " function.
- 2) Put the download disc on the tray.
- 3) Press and hold a " STOP " button for playback,
then press a " DISC NAVIGATOR " button on a front panel.
 - The disc tray closes automatically and the disc is loaded.
 - The disc tray opens automatically after loading.
- 4) Take out the Download Disc.
 - " DISC DWLD " is displayed on FL and download is started.
 - The display on FL changes to " DOWNLOAD-1 "
 - The display on FL changes to " DOWNLOAD-2 "
 - The display on FL changes to " DOWNLOAD-3 " (*)
 - After download is completed, the power turns off, and turns on and a disc tray closes automatically.
 - * It takes for about 5 minutes until download is completed.
- 5) Press and hold a " ESC ", then press " DISP " on a test mode remote control unit for the release version confirmation.
- 6) Confirm a firmware release version.
- 7) Press " ESC " on a test mode remote control unit in order to exit the test mode.

(*) : " DOWNLOAD-3" is displayed only when the TuFL u-com is FLASH type.

2. Serial DOWNLOAD METHOD

[Notes]

This method is secondary way when the disc loading is impossible.

• JIGS

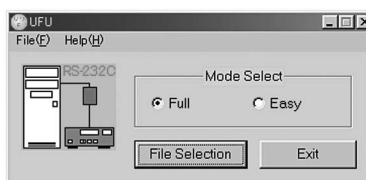
- * PC with serial port
- * RS232C straight cable
- * RS232C I/F jig (GGF1348)
- * 7P FFC (VDA1681)
- * Download program (UFU.exe)
- * Firmware

• Connection

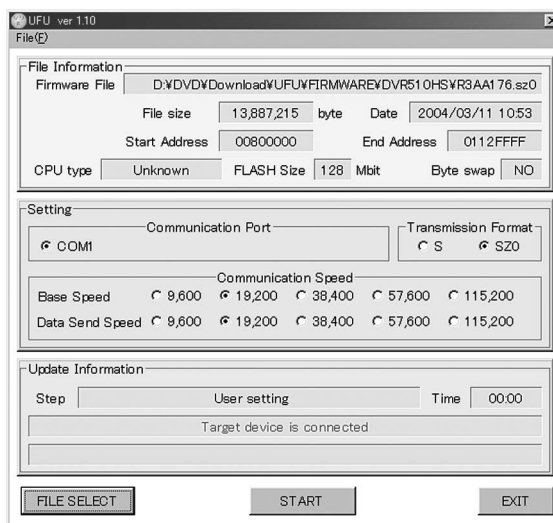
PC ↔ RS232C cable ↔ RS232C I/F ↔ 7P FFC ↔ DVD Recorder

• How to Download

- 1) Connect the 232C I/F JIGS above way.
- 2) Turn on the PC and start the "UFU.exe".



- 3) Select the Firmware file. ("sz0" file)
- 4) Turn the DVD recorder on and start the download program.
"Target Device is connected" is appeared on the screen.



- 5) Select the Communication Speed (Baud Rate)

- a) Base Speed 38,400
- b) Data Send Speed 115,200

- 6) START

- * Even if you click "START" button, sometimes "Communication Error" may come out one to twice, and download may fail. In this case, please click "START" again.
- * Other factors can be considered if download fails 3 times or more.
- * And it takes about an hour for updating the firmware.

7.1.4 SERVICE MODE

For service operations, use the GGF1381 remote control unit for service.

The Service-mode screens consist of nine mode screens, which are classified into such rough categories as recording system and VR playback system, and their subscreens.

- **How to enter Service mode** : Press the ESC then DISP keys in turn while no GUI is displayed. The first screen (version information, etc.) shown below is displayed.
- **How to exit Service mode** : Press the ESC key.
- **How to advance to the next Service-mode screen**
 - : While the first screen is displayed, press directly one of the keys 1-9. For service, use the keys 2, 4 or 5, as shown below.
- **How to advance to a subscreen within the same Service-mode screen**
 - : Press the DIG/ANA key. Pressing the DIG/ANA key repeatedly will change the subscreens within the same Service-mode screen cyclically.

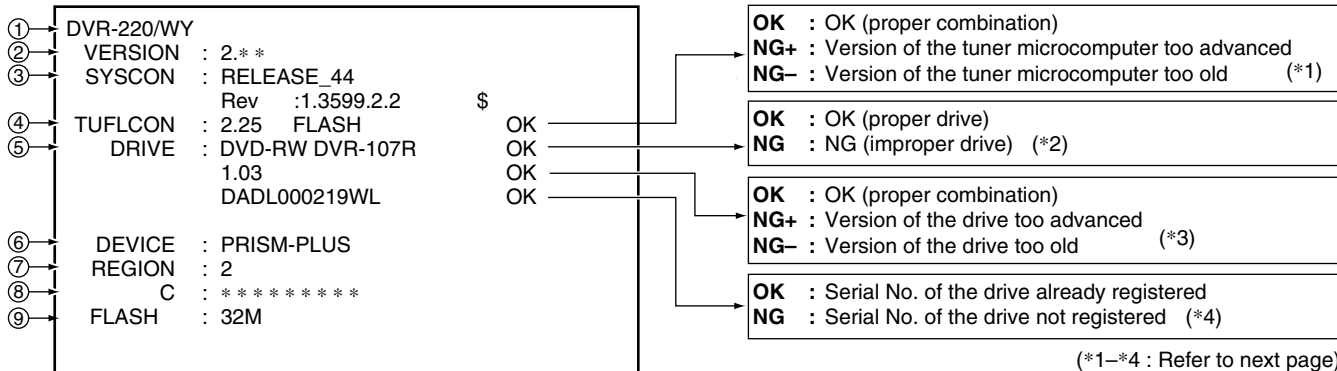
The Service-mode screens to be used for service are as follows:

- 1 = First screen: Version information, etc.
- 2 = Second screen: ATA/ATAPI debug screen (Writer data)
- 4 = Fourth screen: Error log for the VR recording system
- 5 = Fifth screen: Error log for the VR playback system

Note: After entering one of the Service-mode screens, if you wish to shift to another Service-mode screen, exit Service mode first, then reenter Service mode and select your desired Service-mode screen.

Description of Each Service-mode screen

1. First screen (version information, etc.)



- ① Model name/destination
 - ② Version of the recorder software
 - ③ Revision No. of the system-control computer software (Edition administration No. [from top to bottom, common software, firmware, application software])
 - ④ Version No. of the tuner microcomputer, Mask or Flash
 - ⑤ Information on the built-in drive (Model name, version No., model type, serial No.)
 - ⑥ Version No. of PRISM
 - ⑦ Region No.
 - ⑧ CPRM data (CPRM key No.)
 - ⑨ FLASH ROM information
- Result of the combination ckeck with system u-com

While the first screen shown above is displayed, press the DIG/ANA key to enter the subscreen shown below.

Note: Each time the DIG/ANA key is pressed, the display changes between the first screen and its subscreen.

Subscreen: Result of error-rate measurement

ERR RATE : x.xe-x/

Note: Be sure to start playback after displaying this subscreen to calculate the error rate.

During playback in VR mode, the average error rate of the past 10 VOBUs is displayed, and during playback in DVD-Video or Video mode, the average error rate of the past 256 sectors is displayed. During playback in VR mode, the rotation rate of the drive (/: normal speed, no display = double speed) is also displayed.

• **When "NG" is displayed at First screen (version information, etc)**

(*1) NG+ : Version of the tuner microcomputer too advanced
NG- : Version of the tuner microcomputer too old

A

1. When TUFL μ -com is MASK type

NG+ : Download the firmware.

NG- : Replace the TUFL μ -com or JCKB ASSY.

2. When TuFL μ -com is FLASH type

NG+ : Download the firmware.

NG- : Download the firmware.

(*2) NG : NG (improper drive)

B

Replace the correct Drive Assy.

(*3) NG+ : Version of the drive too advanced
NG- : Version of the drive too old

NG+ : Download the firmware.

NG- : Download the firmware.

(*4) NG : Serial No. of the drive not registered

Check the part No. and replace the correct Drive Assy.

C

D

E

F

4. Second screen (ATA/ATAPI debug screen)

- A Subscreen 1 of the second screen is displayed when the ESC, DISP, then "2" keys are pressed, in that order.
Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 4.

• Subscreen 1: Command log (ALL) of ATA/ATAPI DEBUG OSD

```
ATA / ATAPI History - ALL
32 0100000000000A000 OK
32 2A000000DEBB000063000 OK
32 2A000000DF1E000063000 OK
32 2A000000DF81000063000 OK
32 2A000000DFE4000062000 OK
32 2A000000E046000063000 OK
32 2A000000E0A9000063000 OK
32 2A000000E10C000063000 OK
>32 2A000000E16F00006200023A00
```

(Not for Service)

• Subscreen 2: Command log (ERROR) of ATA/ATAPI DEBUG OSD

(Not for Service)

• Subscreen 3: Writer maintenance information of ATA/ATAPI DEBUG OSD

- C The cumulative power-on time and error log that are administered by the writer are displayed. Such information is obtained when the power is turned on. Thereafter, each time the SEARCH key on the remote control unit for service is pressed while subscreen 3 is displayed, the updating command is sent, and the data on the subscreen are updated. Care must be taken when updating this subscreen, because an undesired command is inserted if it is executed while recording, etc.

ATA / ATAPI Writer MaintenanceInfo	
① Power ON	00 00 00 0000 00000000
0102:56	01 00 00 0000 00000000
DVD	02 00 00 0000 00000000
② R0053:48	03 00 00 0000 00000000
③ W0022:16	04 00 00 0000 00000000
CD	05 00 00 0000 00000000
④ R0034:04	06 00 00 0000 00000000
⑤ W0000:00	07 00 00 0000 00000000
	00-00

← Error log for the Writer

(Not for Service)

- ① Power-on time/cumulative power-on time
- ② Duration of emission of the laser diode (LD) for DVD-R/DVD while reading
- ③ Duration of emission of the LD for DVD-W/DVD while writing
- ④ Duration of emission of the LD for CD-R/CD while reading
- ⑤ Duration of emission of the LD for CD-W/CD while writing

(Reference)

MTTF time of each LD (as the guideline of life span of each LD)

R7R Drive Assy (Read + Write total time)

DVD : 4700h

CD : 11000h

• Subscreen 4: ATA/ATAPI DEBUG OSD_LD degradation judgment

The degrees of degradation of the LD (laser diode) for the writer (LDs for CD and DVD separately), temperature, and RF level are displayed. To update the data on the subscreen, press the SEARCH key on the remote control unit for service while subscreen 4 is displayed. See Table 1 below for a description of each item and the conditions for updating data.

ATA / ATAPI - LD Degrade				
①	CD	: 0070	104 %	OK
②	DVD	: 0068	96 %	OK
③	TMP	: 00A3	41 °C	
④	ADJ	: 0067	26 °C	
⑤	RF	: 3D70		
⑥	TLT	: FFD5		

Table 1: Description of each item and conditions for updating data

No.	Item	Description	Conditions for updating by pressing the SEARCH key	Remarks
①	CD	Degradation judgment of LD for CD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive)	No disc inserted in the disc tray	*1
②	DVD	Degradation judgment of LD for DVD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive)	No disc inserted in the disc tray	*1
③	TMP	Current temperature inside the Writer	No disc inserted in the disc tray	*1
④	ADJ	Temperature (approx. 25°C) inside the Writer during adjustment	No disc inserted in the disc tray	*1
⑤	RF	RF level (16-bit data, proportional calculation performed using the actual RF level value with 2.5 V = 0xFFFF as the maximum value, displayed in 4-digit hexadecimal)	During playback of disc medium	*2
⑥	TLT	Writer adjustment data for straight (non-HDD) model (FFFF is displayed when the writer is not adjusted.)	No condition	

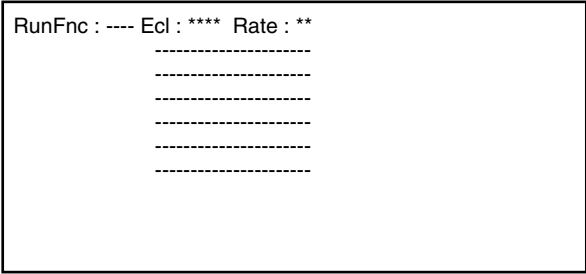
*1 : For correct judgment, after leaving the unit at a normal temperature (25°C typ.) for some time, judgment must be performed immediately after the unit is turned on with no disc loaded.

*2 : Use this item only for confirmation before and after lens cleaning, as the lens becomes dirty with dust.

3. Fourth screen (VR-recording-related error log)

A Subscreen 1 of the fourth screen is displayed when the ESC, DISP, then "4" keys are pressed, in that order.
Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 11.

• Subscreen 1:

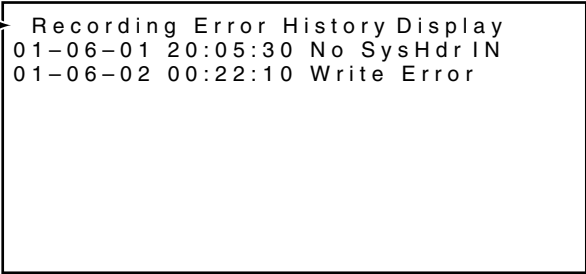


(Not for Service)

• Subscreens 2 and 3:

These subscreens are not for service use.

• Subscreen 4: Error log for VR recording



Note : The information on this screen is not stored in the memory and will disappear when the power is turned off.

- ① Recording-related error log for the last 18 errors, divided into 2 screens (generation time [year-month-day, hour:minute:second], error data in simplified description)

Notes:

- For details on error messages, see Table 2 "Description of VR-recording-related errors".
- The two error-log screens can be switched by pressing the SPEED+ or SPEED- key.

• Subscreens 5 to 11:

These subscreens are not for service use.

4. Fifth screen (Error log for VR playback)

Subscreen 1 of the fifth screen is displayed when the ESC, DISP, then "5" keys are pressed, in that order.

Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 4.

• Subscreen 1:

```
G : 001-01 00h00m00s00#-. -e-- 00.00M
Tgt : STOP Now : STOP Spd : 0
Man : STOP Sub : 0 VBF : 000 ABF : 00
TrMd : STOP TrSt : 0 TNo : Ver : 00
RvMd : STOP RvSt : 0 DNo : Aer : 00
CcSt : STOP Id : 00000000
Stc : 00000000 Tpp-Av1 : +-0 V-A : +-0
MPEG2 720x480 A0 AC-3 2ch 0256k
NT ASP : 43 CGMS : 0 APS : 0 Src : 0
END : 00h00m00s00 Cell : 000
```

• Subscreen 2: Error log for VR playback

```
① G : 01-01 00m00s#-. -e-- 00000000
    h m s Message h m s Err
② L001 : 000000 Tr : Nullblk
    L002 : 001230 Tr : SchLate
    L002 : 004103 Tp : VobDif+
    L002 : 004104 Tp : VobDof-
```

Note : The information on this screen is not stored in the memory and will disappear when the power is turned off.

- ① Data on location of the display
Original(G)/play list (L), title No., chapter No. (X:XX-XX), time of the display (min, sec, frame [XXmXXsXX]), busy mark of the virtual mechanical-control computer (#), error rate of the transfer data (X.XeXX), playback logical address (ID [XXXXXXXXXX])

- ② Error message log
Original(G)/play list (L), title No., time of generation (min, sec [XXX:XXXX]), playback-related error log for the last 13 errors (XX:XXXXXX)

Notes:

- For details on error messages, see Table 1 "Description of VR-playback-related errors".
- If a VR-playback-related error is generated, a problem in data reading from the disc may be suspected. (The possibility of a problem on the drive side is high.)

• Subscreens 3 and 4:

These subscreens are not for service use.

Table 1: Description of VR-playback-related errors

Error Message	Description
Tr : NullBlk	Transfer task: NULL at the top block (Detecting NG stream made at the DVR-1000 series and starting protection process.)
Tr : ReadErr	Transfer task: ATA read error
Tr : SchLate	Transfer task: ATA search late
Tr : SemTOvr	Transfer task: Timeout for gaining semaphore (no synchronization with the display)
Tr : NaviErr	Transfer task: Inconsistency between NAVI (navigator) of management data and actual NAVI
Tr : OrderEr	Transfer task: Inconsistent order
Mn : Av1Hang	Main task: Detects hang-up of AV decoder and starts recovery
ERR_RCV!	TPP task: Detects hang-up of AV decoder and starts recovery
Tp : VobDif+	TPP task: The decoder STC advances by 1 VOB hour.
Tp : VobDif-	TPP task: The STC of the management information advances
Tp : midNULL	TPP task: The management information pointer designated was NULL.
Tp : ScanNg	TPP task: Failure to set the TPP memory when scanning was canceled.
Tp : RStepEr	TPP task: Although the reverse step had failed, the operation was forcibly terminated because the top cell was located.
Tp : tppErr	TPP task: Inconsistency occurred.
Rv : 1stTOvr	Reverse playback task: Timeout for waiting for interruption to the top VOB immediately after starting decoding
Rv : OpnTOvr	Reverse playback task: Timeout for waiting for B-picture of the open GOP immediately after starting decoding
Rv : OpiTOvr	Reverse playback task: Timeout for waiting for I-picture of the open GOP immediately after starting decoding
Rv : LnkTOvr	Reverse playback task: Timeout for waiting for link
Rv : LnkFail	Reverse playback task: Starts compensation by detecting link failure
Rv : R2FTOvr	Reverse playback task: Starts retrial after detecting timeout from reverse pause to forward pause
Rv : TopVbEr	Reverse playback task: Forced termination because of a possible error of the top data during reverse normal playback
Rv : OrderEr	Reverse playback task: Inconsistent order
Av : B/CTOvr	AV1: Buffer-clear timeout
Av : StrmOvr	AV1: Timeout for waiting for stream ready
Av : TpmTOvr	AV1: Timeout for TP mode change
Av : SpmTOvr	AV1: Timeout for a step command
CC_OS_ERR	Closed caption task: OS error

Abbreviations:

STC = System Time Clock

VOBU = Video Object Unit

GOP = Group Of Picture

B-picture = Bidirectionally predictive-picture

I-picture = Intra-picture

P-picture = Predictive-picture

TP mode change = AV1 term (Trick Play mode change)

Table 2: Description of VR-recording-related errors

● Error related to MPEG Encoder

Error Message	Description
Stream NG	Inappropriate input stream data
Strm Start NG	Failure to start encoding (reasons not clear)
AVEnc Hang	Inappropriate MPEG encoder
No SysHdr IN	System packet is not input periodically
Strm Start NG	Timeout waiting for system packet input at the beginning
IN Encode *	Changes cannot be made in the process of encoding
EncModul Hang	Encoder routine is hung up.

● Error related to Drive system

Error Message	Description
BUF Overflow	Overflow of the Stream Buffer
Drive Hang	The Drive is hung up.
Write Err	The Drive failed to write and could not be recovered.
Read Err	Reading failed, ECC failed, etc.
Drv Hard Err	Abnormality in the drive hardware or firmware
Mech No Res	No response from the mechanical-control computer
Drv Timeout	Timeout waiting for drive operation
NWA Exhaust	NWA surpassed and impossible to use
MKB Invalid	MKB reading error
Drv Err	General error of the drive
Fail Repair	Repair failed
ReadOnly DISC *	Because some data are invalid, data cannot be written
May Be V mode	AlthoughTMP_VMG1 is not written, it may be Video Mode disc.
Rzn Rsv NG	Reserve RZone failed
Rzn Cls NG	Close RZone failed
Rzn Rpr NG	Repair RZone failed
Bdr Opn NG	Open Border failed
Bdr Cls NG	Close Border failed
Format NG	Format failed
OPC NG	OPC failed
PCA Full	PCA has been used up.
RMA Full	RMA has been used up.
VTSl_B Wr Err	Video Mode VTSl BUP Write Error
VTSl Wr Err	Video Mode VTSl Write Error
TMP-VMG WrErr	Video Mode TMP VMG1 Write Error
CLS Rzon Fail	Video Mode Close Rzone failure

● Other Errors

Error Message	Description
DRAM NG	Abnormality in access to the Work DRAM
SRAM NG	Abnormality in access to the backup work SRAM
CPRM IC NG	Inappropriate CPRM IC
Drive Destroy	The drive has crashed.
MKB REVOKED	Error in gaining data
WM Cracked	WM Cracked
VBR-SRAM NG	Abnormality in VBR SRAM
BK BATT Down	Backup RAM data has been erased.
BK FSYS Dirty	Backup RAM data has not been wrtten on the File Sys.
VOBU Info NG	Inappropriate VOBu information
Ourob Strm NG	Inappropriate stream data to the Ouroboros input
WaterMark Det	Watermark detected
No Video	No video input (not locked)
Disc Full	No further data can be written because the disc is full.
No More Info *	No more space in the internal work-management area
No Permission *	No permission to write to the disc
Limit Over *	Standard maximum limit exceeded
Rec Pause *	No operation permitted during recording pause
Invalid Param *	Invalid parameter
Protect Src *	Source to be recorded is copy-protected.
Now Busy *	In the process of the emergency processing
Invalid Disc *	The disc cannot be recognized.
Invalid UDF *	Invalid UDF content
Invalid VMG *	Invalid VMG content
Invalid TMVMG	Invalid TMP_VMG content
Unmatch Stamp *	Impossible to modify because of nonmatching time stamp
Virgin DISC	Virgin Disc
SW Vpb mode *	Switching to video playback routine is required.
SW Vrec mode *	Switching to video recording routine is required.
NV Pck MK Err	Error in creating NaviPack
NV Pck DMA Er	Inappropriate NaviPack DMA
Cell Close NG	Cell Close NG
Relocation Do	VR-recording data was relocated
Something *	undetermined error
Status NG *	Abnormality in change of statuses
Irr Action *	Incorrect action
Abort *	Cancellation
BusReset Done	Bus Reset has been excecuted.
Repair Excec	Repairing has been executed.
Format Excec	Formatting has been executed.
BUG	Some bugs
PARAM NO ACCP	Recording parameter is not matched.

● Other Errors (continued)

Error Message	Description
DRAM CLR Err	Video Mode DRAM (Stream Buffer) Clear failure
V Categ ID NG	Inappropriate Category ID
V Cate Inf NG	Inappropriate Category information
V Ext TY NG	Type NG
V Ext MAX Ovr	Count Max exceeded
V ExtToo Big	The extension file is too large.
Over Heat	Abnormal temperature

● No Error

Error Message	Description
Non Err *	Normal

Notes;

- Any error message marked with * is displayed "RecErr : -----" on the Subscreen 1 of the fourth screen.
- In a case of an error in the drive system, scratches or dirt on a disc, or a problem of the drive itself (dirty pickup) may be suspected.

Abbreviations:

ECC = 4 byte Code for Error Correction
 UDF = Universal Disc Format
 PCA = Power Calibration Area
 OPC = Optical Power Control
 NWA = Next Writable Address

VMG = Video Manager
 RMA = Recording Management Area
 MKB = Media Key Block
 TMP_VMG1 = Temporary Video Manager
 Information
 Border = from Lead-in to Lead-out

Table 3: List of Key Codes**How to enter each check mode**

Test mode remote control unit : [A8**]

Remote control unit supplied with the DVR : [AB**]

No.	Check Item	Key Input	Operation / purpose	Remarks
1	EE system (same as preview)	[ESC] → [A.MON]	Turns on/off EE mode cyclically	Make sure that CGMS = 11 becomes when CGMS = 10 is input. EE mode: Simulation mode for recording status
		[PLAY]	Starts the EE system in EE mode (main-unit setting rate)	
		[STOP]	Stops the EE system in EE mode	
2	Error-rate measurement	[ESC] → [SIDE B]	V-mode recording: After recording for 10 seconds, the unit starts playback while displaying the error rate. DVD-Video: The error rate is automatically measured, then the result will be displayed.	For details, see " 7.1.5 ERROR RATE MEASUREMENT ".
3	Settings for specific areas	[ESC] → [CHP/TIM]	Enters Adjustment mode for AVIO settings	Settings are made for the selected input (TUNER, LINE).
		[ESC]	Determines the settings, then exits Adjustment mode	For details, see " 7.1.6 VIDEO ADJUSTMENT FOR SPECIFIC AREA ".

How the ESC code is processed

- When the ESC code is received, ESCAPE mode is entered, but in combination with the code(s) that follow(s), a specific meaning is added.
- If ESC codes are received continuously, ESCAPE mode is retained.

How to enter Error-Rate Measurement mode

Press the ESC key then the SIDE-B key of the remote control unit for service to enter Error-Rate Measurement mode. During playback of DVD-VIDEO, Error-Rate Measurement mode can also be entered by pressing the ESC key then the PLAY key.

How to exit Error-Rate Measurement mode

Press the ESC key. The error-rate display disappears, and Error-Rate Measurement mode is exited.

Note: The error rate cannot be measured in VR mode or during CD playback.

Functions

- ① Video-mode recording (recording medium)
In this mode, DVD recording is automatically performed for 10 seconds, the recorded DVD title is played back while the error rate is being measured, then as soon as playback of the recorded DVD title is finished, playback stops.*1 After error-rate measurement is finished, the average error rate will be displayed on the FL display and OSD. Only in a case in which the calculation of the average error rate fails, the tray will open.
- ② DVD-VIDEO (playback medium)
Only during playback, when the ESC key then the SIDE-B key (or the ESC key then the PLAY key) are pressed, the error rate is calculated and displayed on the FL display and OSD.(*2) Only in a case in which the calculation of the average error rate fails, the tray will open.

Changes of display

Table 1: Video mode (recording medium)

Operation	Display	
	FL Display	OSD (On Screen Display)
"ERROR RATE" is displayed on the FL display for an instant.	ERROR RATE	
DVD recording starts.	ERROR RATE	
DVD recording is performed for 10 seconds.	x x x x x	
The recorded DVD title is played back while the error rate is being measured, then as soon as playback is finished it stops.	ER x . x E - x	ERR RATE : x.xE-x -
After error-rate measurement is finished (*1), the average error rate, the measurement-finish mark (*), and the OK/NG-judgment result (*3) will be displayed on the FL display and OSD. (If the tray opens as a result of NG judgment, the display on the FL display and OSD will be retained.)	ER x . x E - x	ERR RATE : x.xE-x * OK

Table 2: DVD-Video (playback medium)

Operation	Display	
	FL Display	OSD (On Screen Display)
Only during playback, when the corresponding keys are pressed, the error rate is calculated and displayed on the FL display and OSD. (*2)	ER x . x E - x	ERR RATE : x.xE-x -
After error-rate measurement is finished (*1), the average error rate, the measurement-finish mark (*), and the OK/NG-judgment result (*3) will be displayed on the FL display and OSD. (If the tray opens as a result of NG judgment, the display on the FL display and OSD will be retained.)	ER x . x E - x	ERR RATE : x.xE-x - OK

*1 : Whether error-rate measurement is finished or not is judged, as shown in Table 3 below.

Table 3: On judgment whether error-rate measurement is finished or not

Recording Mode	Judgment whether error-rate measurement is finished or not	Recording/playback duration required for error-rate measurement
Video mode	After playback of a certain amount (*) of data Measurement of the 16 ECC blocks is performed 16 times, then the grand sum is used for calculation of the error rate. The capacity is as follows: 16 ECC blocks × 16 sectors × 2048 bytes × 16 times = 8388608 bytes = 67108864 bits	The time required for completion of error-rate measurement varies, depending on the input video signal to be recorded. (The more the motion in the input video signal to be recorded is animated, the shorter the playback time required for completion of error-rate measurement becomes.)

*2 : During DVD-VIDEO error-rate measurement, even after error-rate measurement is finished, playback continues, and the display of the error rate results is retained. In this playback mode, if Error-Rate Measurement mode is exited by pressing the ESC key, then it is reentered by pressing the ESC and SIDE-B keys (or ESC and PLAY keys), the error rate will not be updated, and the previous value is displayed. To reset the previous error rate, stop disc playback.

*3 : OK/NG judgment

In DVD/VIDEO and Video Mode recording, OK/NG judgment is displayed under the following conditions:

Table 4: List of OK/NG threshold values

Disc Type	Recording Mode	Finalized or not finalized	Reference Value	Display
DVD-VIDEO			8.0×10^{-4}	OK / NG
DVD-R	Video mode	Finalized	1.0×10^{-3}	OK / NG
		Not finalized	1.0×10^{-3}	OK / NG
DVD-RW	Video mode	Finalized	1.0×10^{-3}	OK / NG
		Not finalized	1.0×10^{-3}	OK / NG

7.1.6 VIDEO ADJUSTMENT FOR SPECIFIC AREA

Purposes: Depending on the area, jitter may appear in a picture received by the tuner, as conditions of signals received by the tuner are different from area to area. To correct this kind of problem, the function of the System Codec AVIO control section for adjusting signals received by the tuner can be used.

How to enter setting modes: To enter General Setting mode, press the ESC key then the CHP/TIM key of the remote control unit for service. To enter Specific Channel Setting mode, press the DIG/ANA key in General Setting mode.

How to exit setting modes: Press the ESC key. The setting mode is exited, the OSD disappears.

1. Specific Channel Setting mode

This mode is entered when the DIG/ANA key is pressed in General Setting mode. In this mode, specific settings can be made for up to 12 channels. For channels that do not have specific settings, the settings of General Setting mode are applied.

Display in Specific Channel Setting mode (A picture from the tuner can be viewed using the semitransparent OSD display.)

[Display in Specific Channel Setting mode]

[When specific channel settings have NOT been made]

AVIO Specific Area Mode Ver *.*		
Input - [tuner]		
Sync AGC	: ON	*
Threshold	: Normal	*
V-Sync Det	: Normal	*
Std Det	: Normal	*
HD Err Det	: Normal	*

Individual setting state

Input Channel - [1CH]		
Sync AGC	: ---	
Threshold	: ----	
V-Sync Det	: ----	
Std Det	: ----	
HD Err Det	: ----	

General Setting data

Specific Channel Setting data

[When specific channel settings have been made]

AVIO Specific Area Mode Ver *.*		
Input - [tuner]		
Sync AGC	: ON	*
Threshold	: Normal	*
V-Sync Det	: Normal	*
Std Det	: Normal	*
HD Err Det	: Normal	*

Individual setting state

Input Channel - [1CH]		
Sync AGC	: ON	
Threshold	: Auto Threshold Level---[3]	
V-Sync Det	: Normal	
Std Det	: Normal	
HD Err Det	: Normal	

* : setting is the default.

- If a channel that does not have specific settings is displayed, the setting figures are displayed as hyphens (--). If the setting figures are not displayed as hyphens, those settings have been specifically set even if they are identical to the default settings or those of General Setting mode.
- The channels to be displayed in "Input Channel" are as follows:
 - In a case of line input: L1-L3, DV
 - In a case of tuner input: Received channel (a channel to be set in specific channel settings)

Table 2: Key operations in Specific Channel Setting mode

(effective only during recording/playback stop)

Key	Operation	Setting (*: Default)	Remarks
DIG/ANA	Switches cyclically between General Setting mode and Specific Channel Setting mode.	—	—
INPUT SELECT, CHANNEL +/- (*R)	Switches inputs or channels.	—	—
[SIDE A], [SIDE B]	Sets Sync AGC.	ON (*) / OFF	—
[Rev x3], [x3 Fwd]	Sets Threshold level.	(*) Normal Auto Threshold Level Manual Threshold Level Pedestal Level	—
[Rev CHAPTER SKIP] [CHAPTER SKIP Fwd]	Sets Threshold level.	According to the setting of Threshold, the values can be changed within the range mentioned below.	—
		• Normal: The value is fixed, with no display of the value.	—
		• Auto Threshold Level: 0-8 (Default: 0)	—
		• Manual Threshold Level: 0-8 (Default: 0)	—
		• Pedestal Level: 0-8 (Default: 0)	—
[Rev SCAN], [SCAN Fwd]	Sets V-Sync Det.	Normal (*) / Short / Long	—
[Rev STILL STEP], [STILL STEP Fwd]	Sets Std Det.	Normal (*) / Non STD	—
[SPEED +], [SPEED -]	HD Err Det	Normal (*) / Fast / Stop	—
PLAY	All channels assigned to have specific settings are canceled, and the specific settings are reset to their default values.	—	Settings of General Setting mode are not affected.
CLEAR	Initializes the setting of Specific Channel Setting mode.	—	Pressing the key resets the settings of Specific Channel Setting mode for that channel to the initial values. Settings of General Setting mode are not affected.
PAUSE	The specific-setting data for the currently selected channel are reset to their default values. (But the assignment of a channel having specific settings is not canceled.)	—	Settings of General Setting mode are not affected (retained).
ESC	Exits AVIO setting for specific areas, clearing the OSD.	—	—

*R: Refers to keys on the remote control unit supplied with this unit. The keys without "R" refer to the remote control unit for service.

- Screen display when Specific Channel settings are made on 12 (maximum) channels: In such a case. If a channel which does not have specific settings is selected, the individual setting state for that channel is not displayed, as shown in the figure below, and the settings cannot be modified. In such a case, if you wish to make Specific Channel Settings for the currently selected channel, you must clear the Specific Channel Settings for one or more channels beforehand.

**[With 12 channels having specific settings,
when the currently selected channel does not have specific settings]**

AVIO Specific Area Mode		
Input - [TUNER]		
Sync AGC	: ON	*
Threshold	: Normal	*
V-Sync Det	: Normal	*
Std Det	: Normal	*
HD Err Det	: Normal	*
Individual setting state		
Sorry !		
You can store only 12 channels		
for Specific Area mode.		

2. General Setting mode

This mode can be entered only during recording/playback stop. In this mode, each item and its current settings are displayed on the OSD. The currently selected input mode (TUNER or LINE) is displayed. If L1, L2, L3 or DV is selected for input, general settings for the line input can be made, and if TUNER is selected, general settings for the tuner input can be made.

[General Setting mode] (*2)

AVIO Specific Area Mode		
Input - [tuner]		
Sync AGC	: ON	*
Threshold	: Normal	*
V-Sync Det	: Normal	*
Std Det	: Normal	*
HD Err Det	: Normal	*

* : setting is the default.

Table 1: Key operations in General Setting mode (effective only during recording/playback stop)

Key	Operation	Setting (*: Default)	Remarks
INPUT SELECT, CHANNEL +/- (*R)	Switches inputs or channels.	—	—
[SIDE A], [SIDE B]	Sets Sync AGC.	ON (*) / OFF	—
[Rev x3], [x3 Fwd]	Sets Threshold level.	(*) Normal Auto Threshold Level Manual Threshold Level Pedestal Level	—
[Rev CHAPTER SKIP] [CHAPTER SKIP Fwd]	Sets Threshold level.	According to the setting of Threshold, the values can be changed within the range mentioned below.	—
		• Normal: The value is fixed, with no display of the value.	—
		• Auto Threshold Level: 0-8 (Default: 0)	—
		• Manual Threshold Level: 0-8 (Default: 0)	—
		• Pedestal Level: 0-8 (Default: 0)	—
[Rev SCAN], [SCAN Fwd]	Sets V-Sync Det.	Normal (*) /Short/Long	—
[Rev STILL STEP], [STILL STEP Fwd]	Sets Std Det.	Normal (*) /Non STD	—
[SPEED +], [SPEED -]	HD Err Det	Normal (*) /Fast/Stop	—
CLEAR	Initializes the setting of General Setting mode.	—	Pressing the key resets all settings of General Setting mode to the initial values. Settings of Specific Channel Setting mode are not affected (they are retained).
ESC	Exits AVIO setting for specific areas, clearing the OSD.	—	—

*R: Refers to keys on the remote control unit supplied with this unit. The keys without "R" refer to the remote control unit for service.

*1 : In General Setting mode, if the channel displayed has specific settings, the following will be displayed.

[Display in General Setting mode when the channel currently displayed has specific settings]

AVIO Specific Area Mode Ver*. **

Input - [tuner]

Sync AGC : ON *

Threshold : Normal *

V-Sync Det : Normal *

Std Det : Normal *

HD Err Det : Normal *

This channel is set up
individually.

7.1.7 AGING MODE

Notes:

Commands from the remote control unit are accepted during Aging mode.

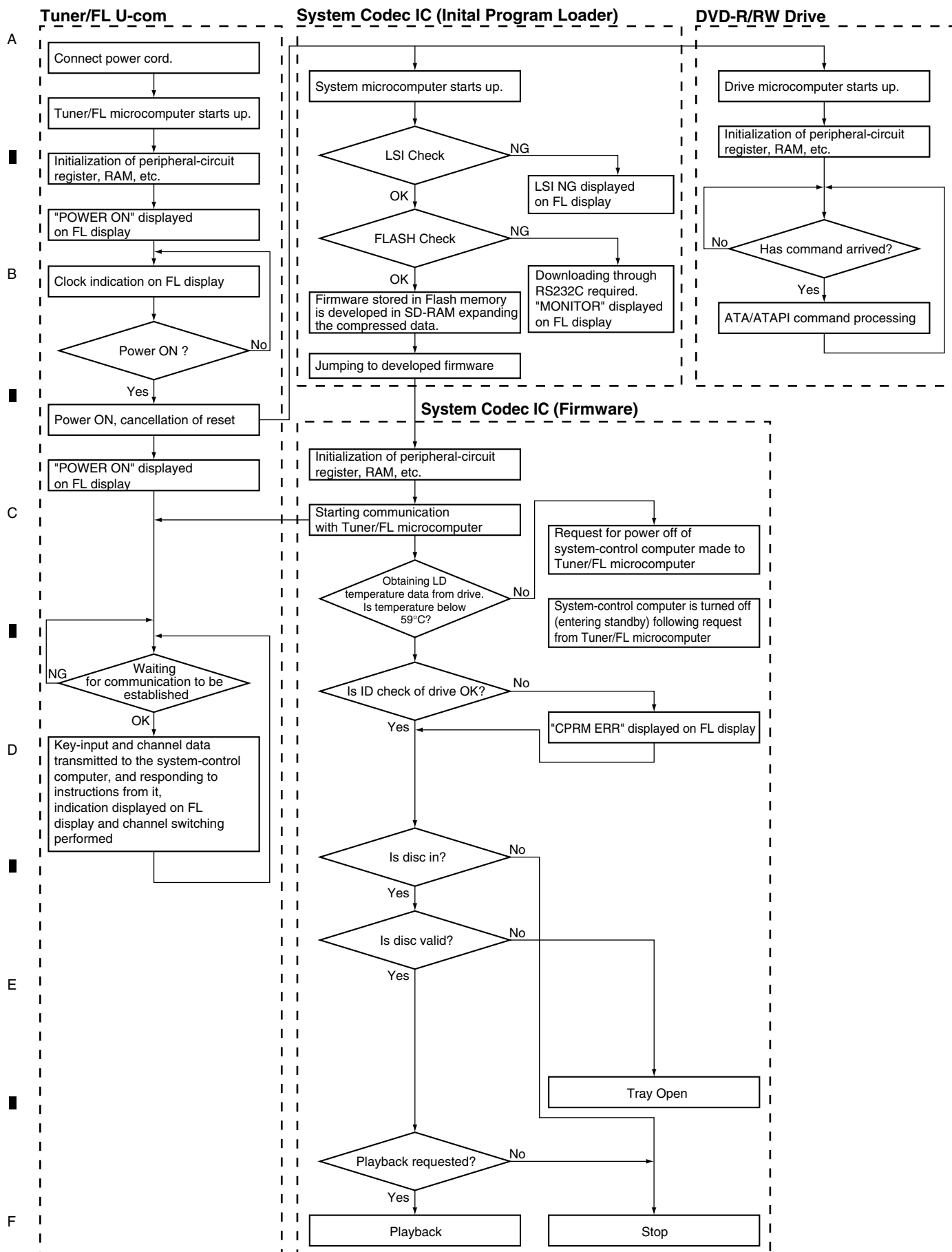
If Aging mode is quit using the ESC key, indications on the FL display will return to normal display.

Cancel timer settings before entering Aging mode.

Set the recording rate beforehand. It cannot be changed during Aging mode.

	Aging for the DVD-RW	Aging for the DVD-R
To enter Aging mode	Press the DVD key to switch to DVD. Install a recordable DVD-RW disc. After disc detection, press the ESC key then the REP.B key on the remote control unit for servicing to enter Aging mode.	Press the DVD key to switch to DVD. Install a recordable DVD-R disc. After disc detection, press the ESC key then the REP.B key on the remote control unit for servicing to enter Aging mode.
To quit Aging mode	Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode. This also results in the following: <ul style="list-style-type: none"> • If during recording: Recording is stopped. • If during playback: Playback is paused. • If during initialization: The unit stops after initialization is finished. • If the tray is being opened/closed: The unit stops after the tray is opened/closed. 	Press the ESC key on the remote control unit for servicing to quit Aging mode and return to Normal mode. This also results in the following: <ul style="list-style-type: none"> • If during recording: Recording is stopped. • If during playback: Playback is paused.
Function	<p>During Aging mode, the following operations are repeated in the order shown below.</p> <ol style="list-style-type: none"> ① The tray opens. ② The tray closes. ③ Initialization ④ Recording for 60 minutes ⑤ Playback for 45 minutes <p>③ Initialization is performed according to the setting specified in "DVD-RW automatic initialization" (accessed by selecting "Unit Setting" then "Option").</p> <p>During Aging, the number of loops is indicated on the FL display, as shown below. [AGING 0001]</p> <p>If an error is generated, the aging operation stops. Note: Indications on the FL display are retained, and this information is also retained as an OSD.</p>	<p>During Aging mode, the following operations are repeated in the order shown below.</p> <ol style="list-style-type: none"> ① The tray opens. ② The tray closes. ③ Recording for 1 minute ④ Recording pause for 6 minutes ⑤ Recording stops. ⑥ Playback for 1 minute ⑦ Playback pause for 6 minutes ⑧ Playback stops. <p>Note: A continuous test of the above operations is possible for approximately 23 hours.</p> <p>After ② the tray closes, disc detection is performed, and if 99 titles have already been registered, the unit stops there. The number of loops is retained and indicated on the FL display. An error indication is retained as an OSD.</p> <p>During Aging, the number of loops is indicated on the FL display, as shown below. [AGING 0001]</p> <p>If an error is generated, the aging operation stops. Note: Indications on the FL display are retained, and this information is also retained as an OSD.</p> <p>Note: Recording time depends on the recording rate set. For example, if the recording rate is MN32, only up to 60 titles can be registered. Check the setting for recording rate before performing aging.</p>

7.1.8 SETUP SEQUENCE

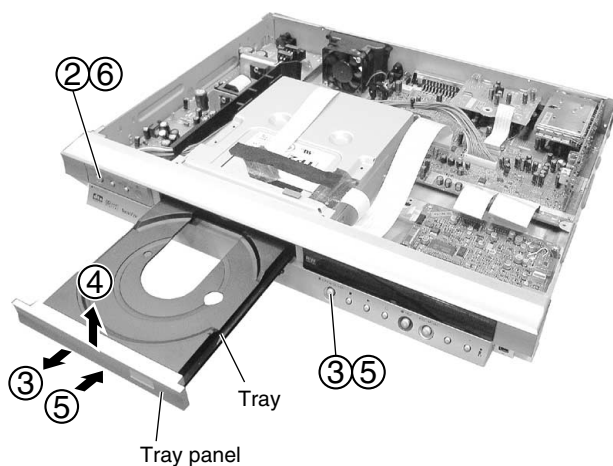


Note: Even if the unit shown in the photos and illustrations in this manual may differ from your product, the procedures described here are common.

Diagnosis of the MAIN Assy

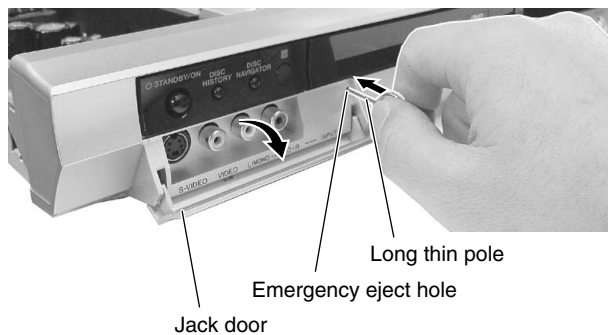
1 Bonnet Case S and Tray panel

- ① Remove the bonnet case S by removing the eight screws.
- ② Press the STANDBY/ON button to turn on the power.
- ③ Press the OPEN/CLOSE button to open the tray.
- ④ Remove the tray panel.
- ⑤ Press the OPEN/CLOSE button to close the tray.
- ⑥ Press the STANDBY/ON button to turn off the power.



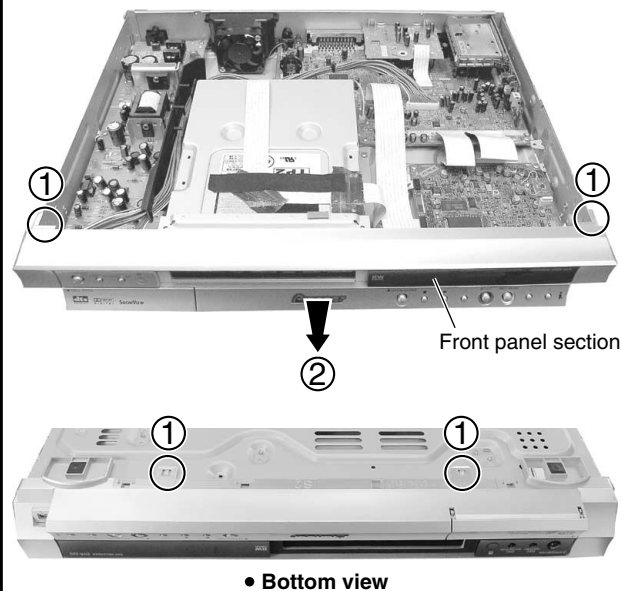
● How to open the tray when the power cannot be on

When the player cannot eject disc tray due to power failure or any other reasons, open the jack door, and use a long thin pole and push the emergency eject hole under the tray panel to eject.



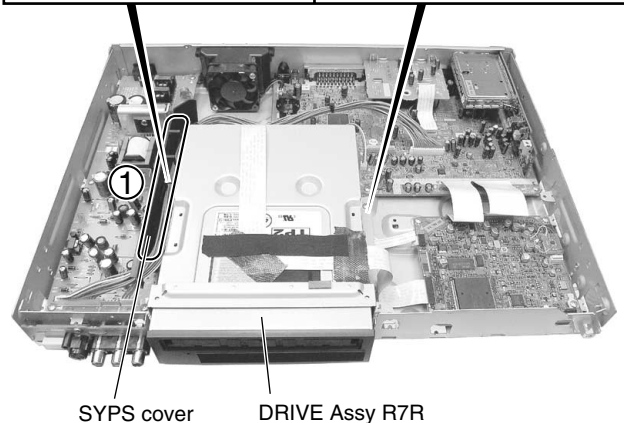
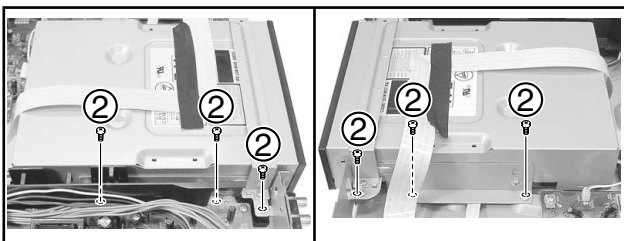
2 Front panel section

- ① Unhook the four hooks.
- ② Remove the front panel section.

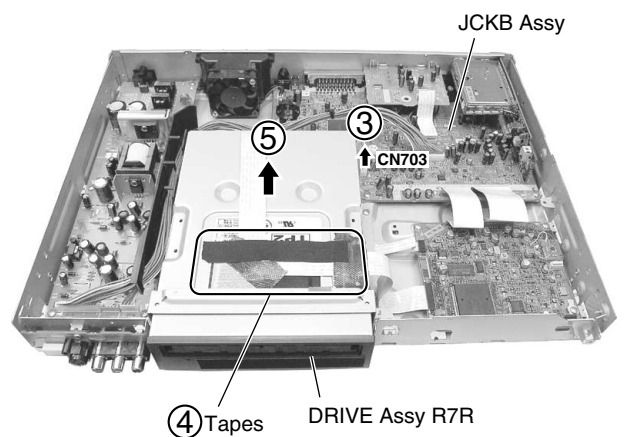


3 DRIVE Assy R7R (DVD-R/RW WRITER)

- ① Remove the two jumper wires from the SYPS cover.
- ② Remove the six screws.

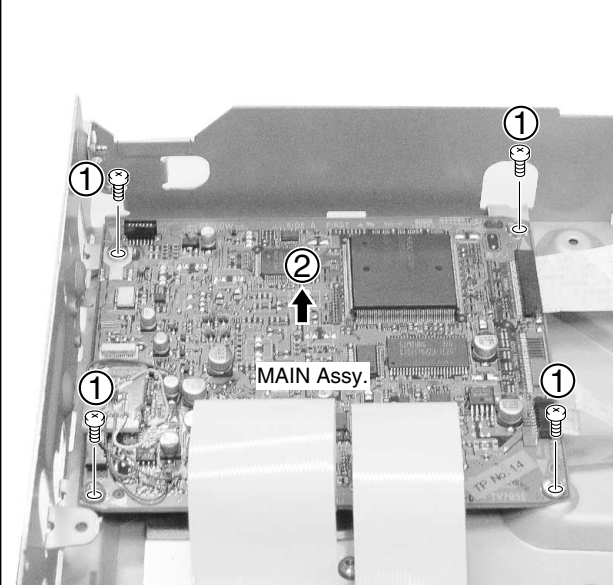


- ③ Disconnect the connector.
- ④ Remove the some tapes.
- ⑤ Remove the DRIVE Assy R7R.



4 MAIN Assy

- ① Remove the four screws.
- ② Stand the MAIN Assy.

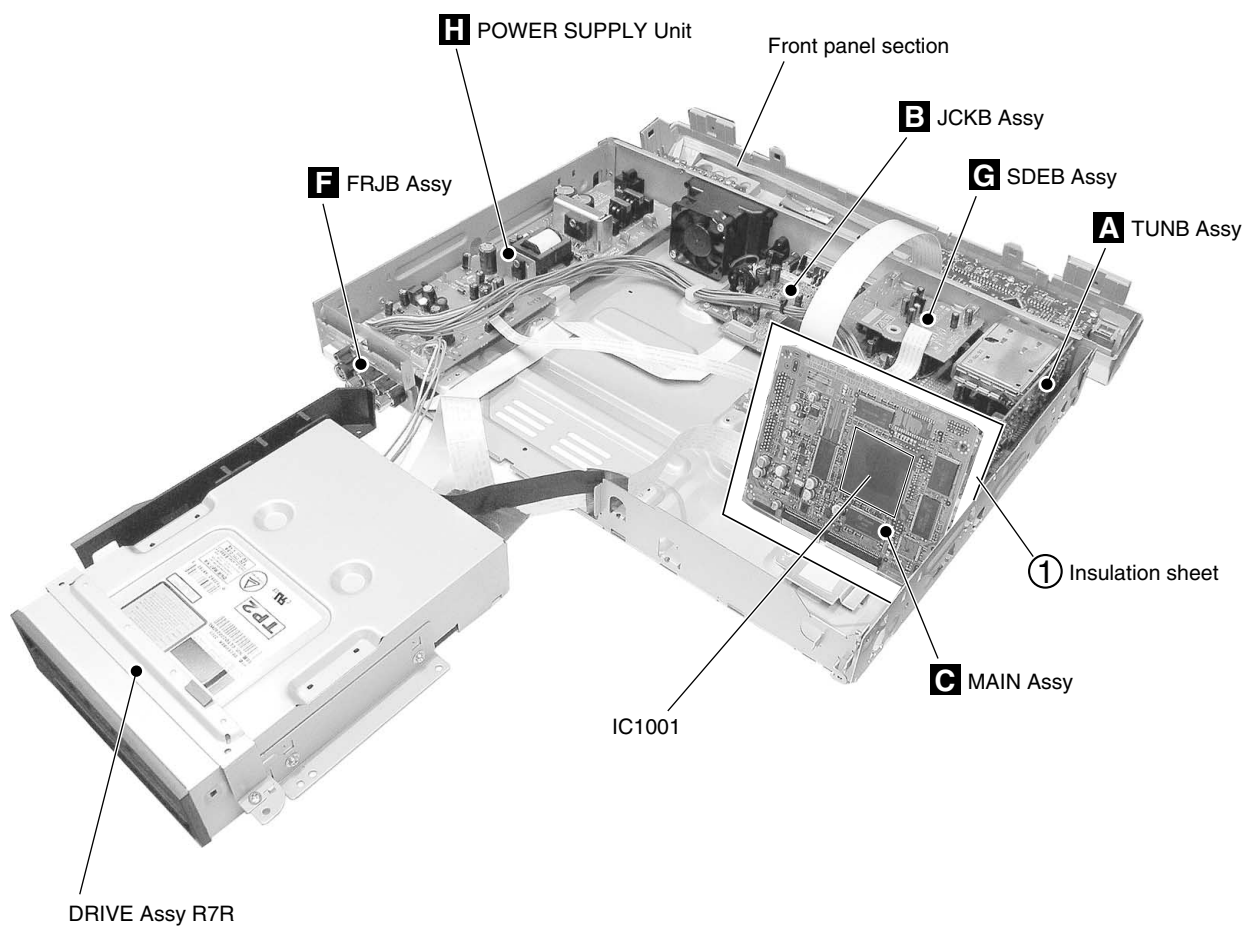


5 Diagnosis

- ① Insert the insulation sheet between the MAIN Assy and base chassis.
- ② Arrange the unit as shown in the photo below.

Caution :

Main IC (IC1001) on the MAIN Assy generate heat to around 80 degrees.
Be careful when works.

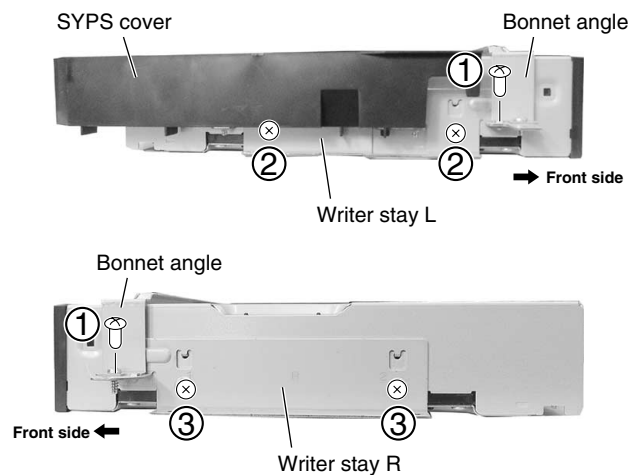


Diagnosis

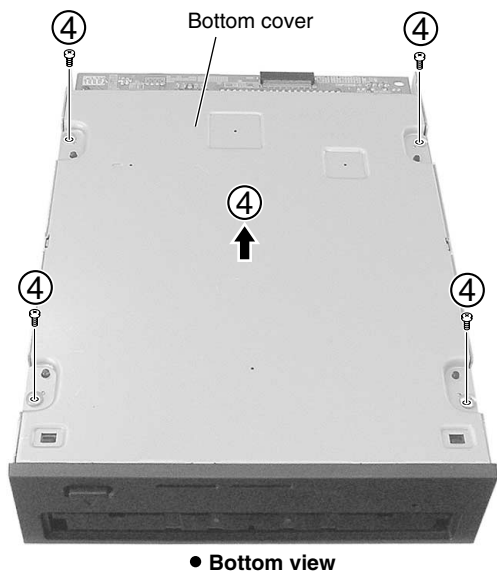


Cleaning the pickup lens

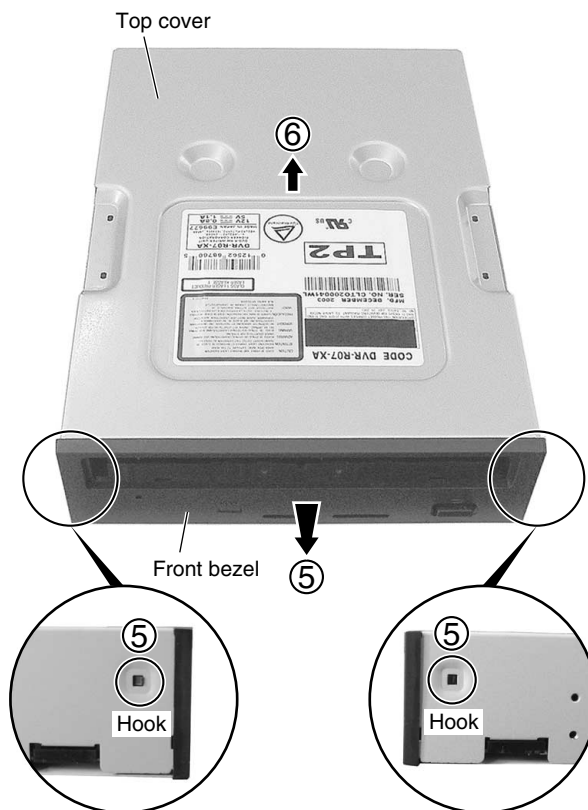
- ① Remove the bonnet angle by removing the two screws.
- ② Remove the writer stay L by removing the two screws with the SYPS cover.
- ③ Remove the writer stay R by removing the two screws.



- ④ Remove the bottom cover by removing the four screws.



- ⑤ Remove the front bezel by unhooking the two hooks.
- ⑥ Remove the top cover.

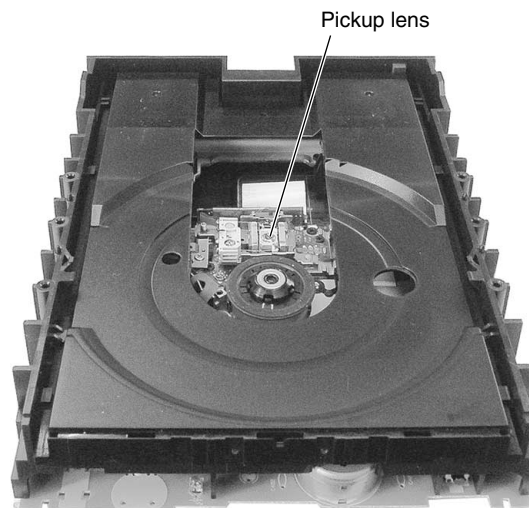


- ⑦ Clean the pickup lens.



Before shipping out the product, be sure to clean the following positions by using the prescribed cleaning tools :

Cleaning liquid : GEM1004
Cleaning paper : GED-008



7.2 IC

• The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

• List of IC

PEG035B, RS5C372A, LC75342M, LA73033M, AK5381VT, PST3428U, PST3809U, M65673WG-A, TDA9818TS, LA73026AV

■ PEG035B (JCKB ASSY : IC202)

• TUFL Microcomputer

• Pin Function

No.	Pin Name	Signal Name	I/O	Function	Active
1	P95/ANEX0/CLK4	FLCLK	O	FL Driver communication line CLK	–
2	P94/DA1/TB4in	SYNC	I	C-Sync of input video	↑
3	P93/DA0/TB3in	AVLINKIN	I	Input line of NexTVViewLink	–
4	P92/TB2in/Sout3	IR	I	Pulse input of remote control	–
5	P91/TB1in/Sin3	J_CLOCK	I		
6	P90/TB0in/CLK3	SYNCAFT	I	C-Sync of input video	↑
7	BYTE	BYTE	I		
8	CNVss	PGM	I	Communication line	
9	P87/XCin	NC	(O)		–
10	P86/XCout	NC	(O)		–
11	-RESET	XRESETIN	I	u-Con Reset	
12	Xout	XOUT	I		
13	Vss	GND	–		
14	Xin	XIN	I		
15	Vcc	VCC	–		
16	P85/-NMI	NMI	I		↓
17	P84/-INT2	(JOGA)	(I)	Not used	
18	P83/-INT1	SLICEONFB	I	Feedback from SLICEON pin	↑ ?
19	P82/-INT0	XINTR	I	Alarm/interval interruption	↓
20	P81/TA4in	LED_HDD	(O)	Not used for straight model	–
21	P80/TA4out	LED_DVD	(O)	Not used for straight model	–
22	P77/TA3in	PSAVE_MUTE	O	for noise suppression when controlling SCART power	–
23	P76/TA3out	FANPWM	O	FAN power control	H
24	P75/TA2in	(JOGB)	(I)	Not used	
25	P74/TA2out	NC	(O)		–
26	P73/-CTS2/-RTS2/TA1in	NC	O		–
27	P72/CLK2/TA1out	AVLINKOUT	O	Output line of NextViewLink	H
28	P71/RxD2/SCL/TA0in/TB5in	SCL	I/O	I2C communication (clock)	–
29	P70/TxD2/SDA/TA0out	SDA	I/O	I2C communication (data)	–
30	Vss2	GND	–		
31	LP2	LP2	O		
32	LP3	LP3	O		
33	LP4	LP4	O		
34	Vdd2	VDD2	–		
35	M2	M2	I	Mode switch	
36	M1	M1	I		
37	P11/SLICEON	SLICEON	O	Slicer operating signal	H?
38	P67/TxD1	TXD	O	Communication line for firmware download/monitor	–
39	P66/RxD1	RXD	I	Communication line for firmware download/monitor	–
40	P65/CLK1	SCLK	(O)	Communication line for firmware download/monitor	–

A

No.	Pin Name	Signal Name	I/O	Function	Active
41	P64/-CTS1/-RTS1/CLKS1	BUSY	O	Communication line for firmware download/monitor	–
42	P63/TxD0	SSTOM	O	SYS controller communication line (Tuner → Main)	–
43	P62/RxD0	SSMTOT	I	SYS controller communication line (Main → Tuner)	–
44	P61/CLK0	SCK	I	SYS controller communication line (clock)	↑
45	P60/-CTS0/-RTS0	HSTTOM	O	Tuner → SYS handshake	L
46	P57/-RDY/CLKout	DLCONT	O	Voltage supply SW of FLASH-ROM writing	L
47	P56/ALE	WRT	O	Write signal	H
48	P55/-HOLD	SDAEEP	I/O	SDA line for EEPROM	–
49	P54/-HLDA	SCLEEP	O	SCL line for EEPROM	–
50	P53/BCLK	VOLCE	O	Communication line CE	H
51	P52/-RD	VOLDATA	O	Communication line DATA	–
52	P51/-WRH/-BHE	VOLCLK	O	Communication line CLK	–
53	P50/-WRL/-WR	DLCE	I	Signal for serial I/O mode selection	–
54	P47/-CS3	NC	(O)		
55	P46/-CS2	NC	(O)		
56	P45/-CS1	NC	(O)		
57	P44/-CS0	BLANK	I	BLANK signal input	–
58	P43/A19	XTHROU	O	Through control of SCART1/2	L
59	P42/A18	NC	(O)		
60	P41/A17	EXTRGB	O		–
61	P40/A16	SWVION	O	Independent source SW for video I/O output circuit	H
62	P37/A15	SWSTBY	O	Standby mode of video input selector	H
63	P36/A14	NC	(O)		
64	P35/A13	BS15SRT	I		
65	P34/A12	SCTHRU	O	SCART loop through control during power OFF	L
66	P33/A11	NC	(O)		
67	P32/A10	NC	(O)		
68	P31/A9	SDET2	I	S terminal detection of Video input 2	L
69	Vcc	VCC	–		
70	P30/A8	NC	I		–
71	Vss	GND	–		
72	P27/A7	NC	(O)		
73	P26/A6	NC	(O)		
74	P25/A5	NC	(O)		
75	P24/A4	NC	(O)		
76	P23/A3	P_SAVEBS	O	RF through output switch	H
77	P22/A2	NC	O		–
78	P21/A1	NC	O		–
79	P20/A0	P_CONT	O	System Power ON	H
80	P17/D15/-INT5	NC	(O)		–

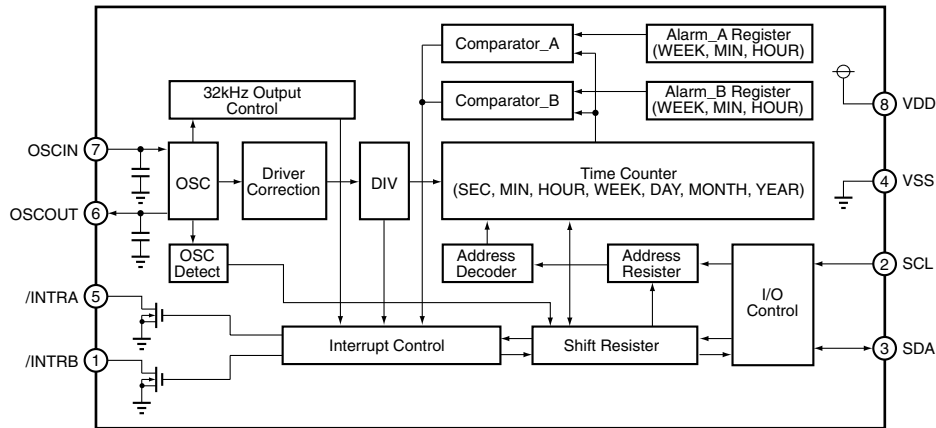
F

No.	Pin Name	Signal Name	I/O	Function	Active
81	P16/D14/-INT4	HSMTOT	I	SYS → Tuner handshake	↓
82	P15/D13/-INT3	DCTRI	I	Change detection of audio condition	↑
83	P14/D12	NC	O		–
84	P13/D11	SU/SAPID	I		
85	P12/D10	ST/STID	I		
86	P11/D9	XRESET	O	System Reset output	L
87	P10/D8	LDASH	O	ColorSystem distinction signal	H
88	P07/D7	STBYQ	O	EU multiplex decoder standby mode	L
89	P06/D6	LM/	O	ColorSystem distinction signal	H
90	P05/D5	I/BG	O	ColorSystem distinction signal	H
91	P04/D4	XP_SAVE	O	Power save control (SCART)	L
92	P03/D3	TUON	O	Tuner power	H
93	P02/D2	NC	(O)		
94	P01/D1	RSTCTL	O	Reset signal mask from the system controller	L
95	P00/D0	FLPON	O	FL Driver Power ON	H
96	P107/AN7/-KI3	MODEL1	A/D IN	Input for destination judgment	–
97	P106/AN6/-KI2	MODEL2	A/D IN	Input for destination judgment	–
98	P105/AN5/-KI1	AGC	A/D IN	Field intensity detection	–
99	P104/AN4/-KI0	FUNC	A/D IN	Function signal input	–
100	P103/AN3	KEY2	A/D IN	Main unit key input	–
101	P102/AN2	KEY1	A/D IN	Main unit key input	–
102	P101/AN1	C/N	A/D IN		–
103	Avss	GND	–		
104	P100/AN0	AFT	A/D IN	AFT voltage input	–
105	VREF	VREF	–		
106	AVcc	AVCC	–		
107	P97/-ADTRG/Sin4	FLSTB	O	Communication line strobe of FL driver	L
108	Vdd1	VDD1	–		
109	SYNCIN	SYNCTEXT	I	Video input for sync. sep.	
110	SVREF	SLICE	I	Slice level input	
111	Vss1	GND	–		
112	Vdd3	VDD3	–		
113	CVIN1	CVIN1	I	Video input for teletext	
114	Vss3	GND	–		
115	FSCIN	FSCIN	I	Fsc input	
116	P96/ANEX1/Sout4	FLDATA	O	Communication line data of FL driver	–

RS5C372A (JCKB ASSY : IC203)

• Real Time Clock IC

● Block Diagram



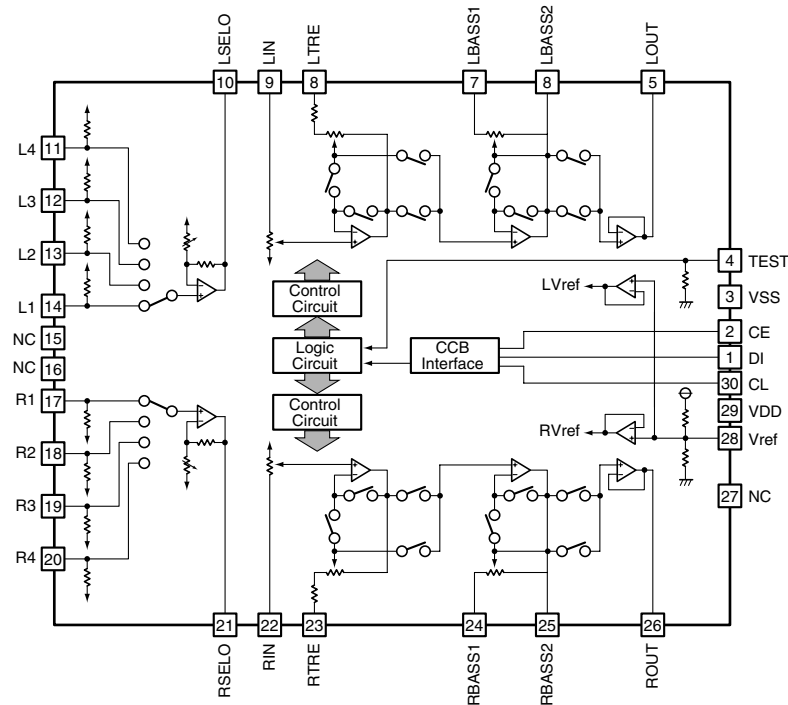
● Pin Function

No.	Pin Name	I/O	Function	
1	/INTRB	O	Interruption output B The output of 32.768kHz (in 32768Hz crystal use), cycled interrupt for CPU, or output alarm interrupt (ALARM_B). This pin output 32.768kHz when activated power from 0V. Nch open drain output.	
2	SCL	I	Shift clock input Synchronize with this clock, and input and output data from a SDA terminal. Exceed VDD, and can input to 6V.	
3	SDA	I/O	Serial input and output Synchronize with SCL, and input and output writing data or readout data. Exceed VDD, and can input to 6V. Nch open drain output in the output.	
4	VSS	—	Ground pin	
5	/INTRA	O	Interruption output A Cycled interrupt for CPU, or output alarm interruption (ALARM_A, ALARM_B). This pin becomes an OFF state when activated power from 0V. N ch open drain output.	
6	OSCOUT	O	Oscillation circuit output	Connect a crystal resonator of 32.768kHz or 32.000kHz between OSCIN and OSCOUT, and constitute oscillation circuit. (component parts of oscillation circuit except crystal resonator have it built-in.)
7	OSCIN	I	Oscillation circuit input	
8	VDD	—	Positive supply input	

LC75342M (JCKB ASSY : IC702)

• Electric Volume IC

● Block Diagram



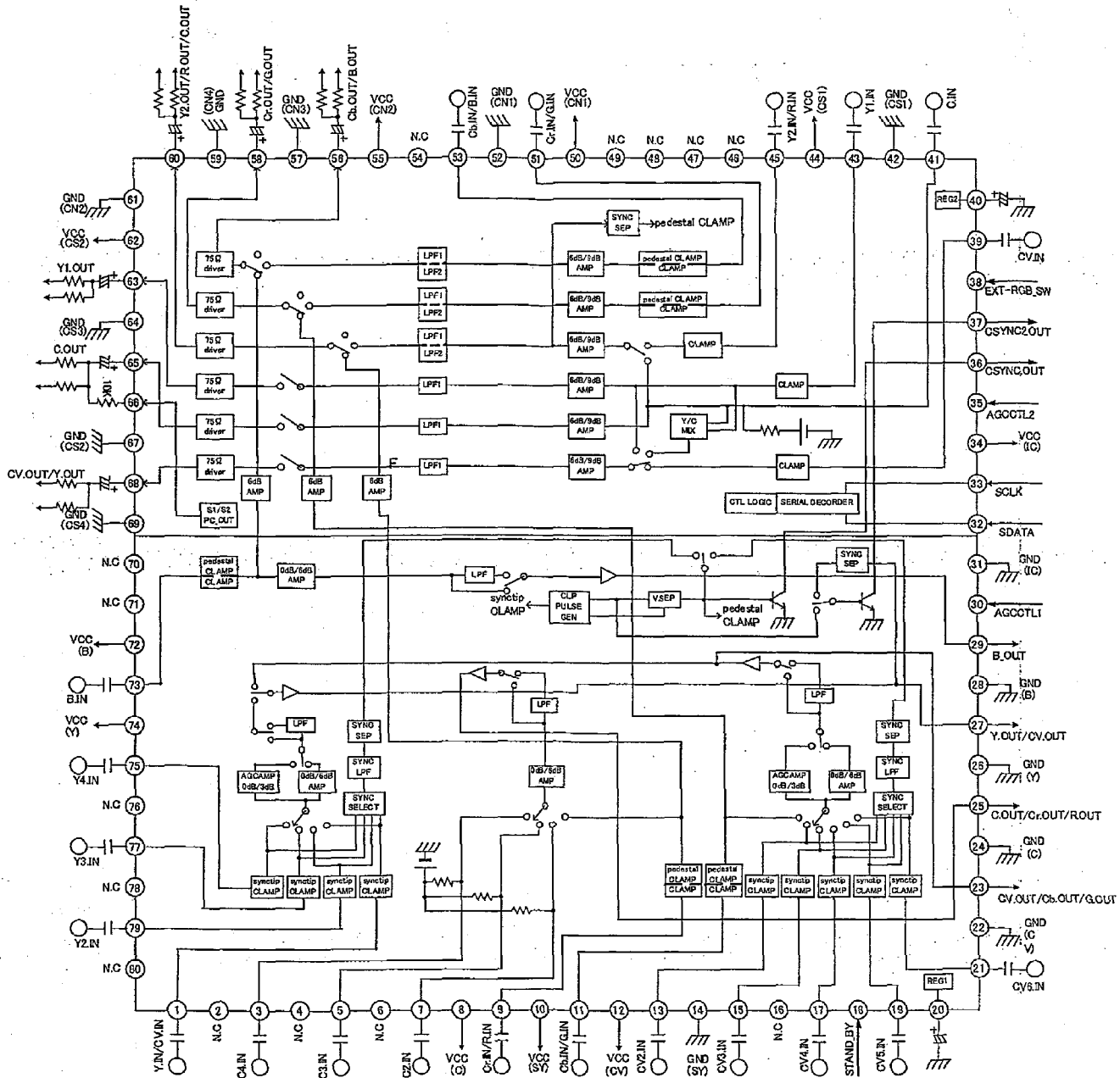
● Pin Function

No.	Pin Name	Function	No.	Pin Name	Function
1	DI	Serial data input for control	16	NC	Not connected
2	CE	Chip enable pin Data are written in the internal latch by a timing of "H" → "L", and each analog switch works. Data transfer is enabled by "H" level.	17	R1	Input signal pin
3	VSS	Ground pin	18	R2	
4	TEST	Pin for electronic volume test Set to VSS electric potential.	19	R3	
5	LOUT	Volume and equalizer output pin	20	R4	
6	LBASS2	Capacitor and resistor connection pins for bus bandpass filter	21	RSELO	Input selector output pin
7	LBASS1		22	RIN	Volume and equalizer input pin
8	LTRE	Capacitor connection pin for treble bandpass filter	23	RTRE	Capacitor connection pin for treble bandpass filter
9	LIN	Volume and equalizer input pin	24	RBASS1	Capacitor and resistor connection pins for bus bandpass filter
10	LSELO	Input selector output pin	25	RBASS2	
11	L4	Input signal pins	26	ROUT	Volume and equalizer output pin
12	L3		27	NC	Not connected
13	L2		28	Vref	0.5XVDD voltage generation block
14	L1		29	VDD	Power supply pin
15	NC	Not connected	30	CL	Clock input pin for control

LA73033M (JCKB ASSY : IC701)

• Video selector and Video driver

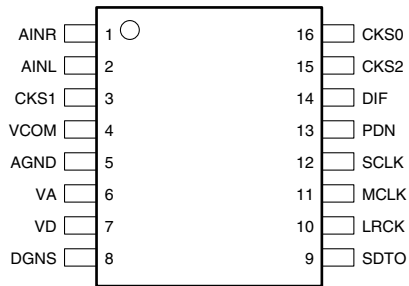
• Block Diagram



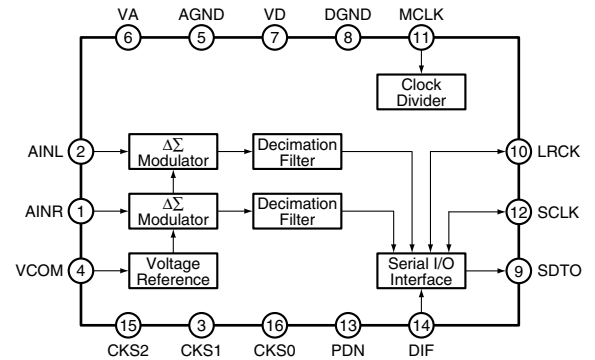
AK5381VT (MAIN ASSY : IC3101)

• 96kHz 24 bit $\Delta\Sigma$ ADC

● Pin Arrangement (Top view)



● Block Diagram

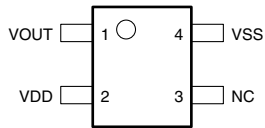
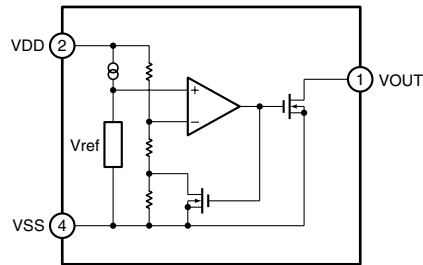


● Pin Function

No.	Pin Name	I/O	Function
1	AINR	I	R ch analog input
2	AINL	I	L ch analog input
3	CKS1	I	Mode select 1
4	VCOM	O	Common voltage output, bias voltage of VA/2 and ADC input
5	AGND	–	Analog ground
6	VA	–	Analog power supply, 4.5V to 5.5V
7	VD	–	Digital power supply, 2.7 to 5.5V (fs = 4k to 48kHz), 3.0 to 5.5V (fs = 48k to 96kHz)
8	DGND	–	Digital ground
9	SDTO	O	Audio serial data output, outputs "L" in the power down mode.
10	LRCK	I/O	Channel clock I/O, outputs "L" by master mode in the power down mode.
11	MCLK	I	Master clock input
12	SCLK	I/O	Audio serial data clock, outputs "L" by master mode in the power down mode.
13	PDN	I	Power down mode "H": power up, "L": power down
14	DIF	I	Audio interface format, "H" : 24 bit I2S compatibility, "L" : 24 bit MSB justify
15	CKS2	I	Mode select 2
16	CKS0	I	Mode select 0

PST3428U (MAIN ASSY : IC4003)

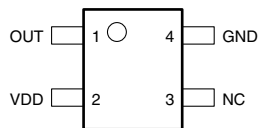
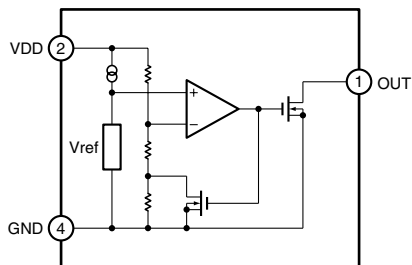
- Reset IC

● Pin Arrangement (Top view)**● Block Diagram****● Pin Function**

No.	Pin Name	Function
1	VOUT	Reset signal output
2	VDD	Power supply / voltage detection
3	NC	Not connected
4	VSS	VSS

PST3809U (MAIN ASSY : IC4005)

- Reset IC

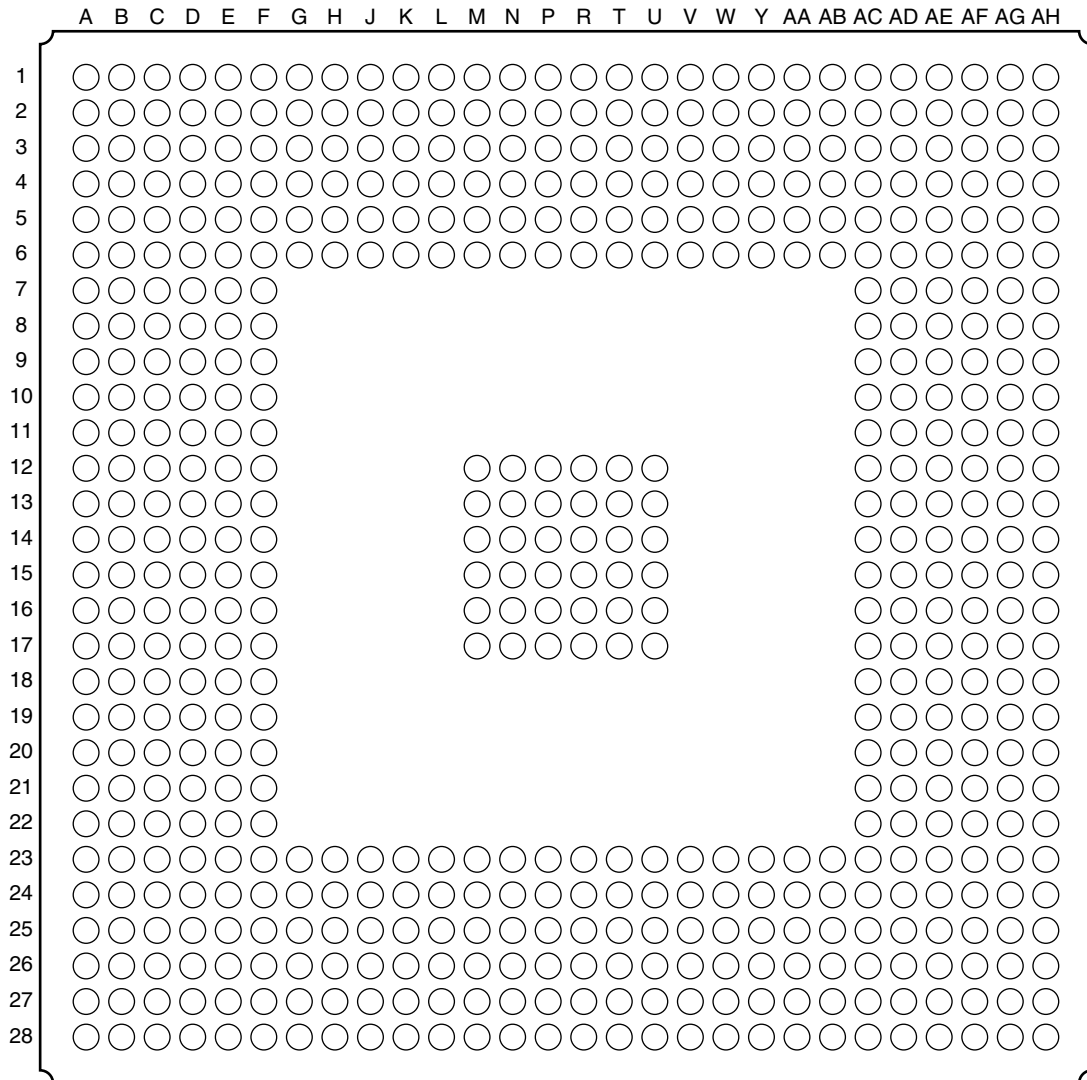
● Pin Arrangement (Top view)**● Block Diagram****● Pin Function**

No.	Pin Name	Function
1	OUT	Reset signal output
2	VDD	Power supply / voltage detection
3	NC	Not connected
4	GND	Ground

■ M65673WG-A (MAIN ASSY : IC1001)

• Signal Processing IC for DVD Recorder

● Pin Arrangement (Top view)



● I/O buffer list

Buffer Name	Main Function	Remarks
PDIDGZ	Input buffer (5V tolerant)	
PDUDGZ	Input buffer (5V tolerant), pull-up	
PDDDGZ	Input buffer (5V tolerant), pull-down	
PDO04CDG	Output buffer, 4mA	
PDO08CDG	Output buffer, 8mA	
PDO0204DGZ	Output buffer, 2/4mA	
PDO0406DSGZ	Output buffer, 4/6mA	For SDRAM IF
PDO0406DSGZ×2	Output buffer, 8/12mA	For SDRAM IF
PDT0204DGZ	3 state output buffer, 2/4mA	
PDB04DGZ	Bidirectional buffer, 4mA	
PDB08DGZ	Bidirectional buffer, 8mA	
PDB0204DGZ	Bidirectional buffer, 2/4mA	
PDB0406DSGZ	Bidirectional buffer, 4/6mA	For SDRAM IF

F

[illegible]

VDD	: 1.2V Power supply
VDD3	: 3.3V Power supply
GND	: Ground

● Pin Function

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
1	VDD3	VDD3	–	3.3V I/O power supply	56	V26	VRT10	–	TOP side reference voltage
2	GND	GND	–	Ground	57	V28	VRM10	–	Common voltage
3	VDD	VDD	–	1.2V LOGIC power supply	58	U25	VRB10	–	Bottom side reference voltage
4	AH28	VDD	–	1.2V LOGIC power supply	59	U26	VRBD10	I/O	Analog test bus (for debugging)
5	AF26	ACCCTL	O		60	U27	DVSSAD10	–	ADC part digital ground
6	AF27	PEDCTL	O	VIDEO-Analog, Output buffer	61	T24	DVDDAD10	–	ADC part digital power supply (3.3V)
7	AG28	HKEYPLS	O	VIDEO-Analog, Output buffer	62	GND	GND	–	Ground
8	GND	GND	–	Ground	63	VDD	VDD	–	1.2V LOGIC power supply
9	AE26	WM1DTI[7]	I/O	WM/VWM, Bidirectional buffer	64	U28	AVDDAD8	–	
10	AD25	WM1DTI[6]	I/O	WM/VWM, Bidirectional buffer	65	T25	AVSSAD8	–	
11	AC24	WM1DTI[5]	I/O	WM/VWM, Bidirectional buffer	66	T26	CIN	I	VIDEO-Analog
12	AE27	WM1DTI[4]	I/O	WM/VWM, Bidirectional buffer	67	T27	VRT8	–	VIDEO-Analog
13	AF28	WM1DTI[3]	I/O	WM/VWM, Bidirectional buffer	68	T28	VRB8	–	VIDEO-Analog
14	AD26	WM1DTI[2]	I/O	WM/VWM, Bidirectional buffer	69	R25	AVDDAD8	–	
15	AE28	WM1DTI[1]	I/O	WM/VWM, Bidirectional buffer	70	R24	AVSSAD8	–	
16	AC25	WM1DTI[0]	I/O	WM/VWM, Bidirectional buffer	71	R26	CRIN	I	VIDEO-Analog
17	AB24	WM1DIO[7]	I/O	WM/VWM, Bidirectional buffer	72	R28	BG8	–	VIDEO-Analog
18	VDD	VDD	–	1.2V LOGIC power supply	73	P28	AVDDAD8	–	
19	GND	GND	–	Ground	74	P27	AVSSAD8	–	
20	AD27	WM1DIO[6]	I/O	WM/VWM, Bidirectional buffer	75	R27	GIN	I	VIDEO-Analog
21	AC26	WM1DIO[5]	I/O	WM/VWM, Bidirectional buffer	76	P26	DVSSAD8	–	
22	AD28	WM1DIO[4]	I/O	WM/VWM, Bidirectional buffer	77	P25	DVDDAD8	–	
23	AA24	WM1DIO[3]	I/O	WM/VWM, Bidirectional buffer	78	GND	GND	–	Ground
24	AB25	WM1DIO[2]	I/O	WM/VWM, Bidirectional buffer	79	P24	EDATA[15]	I/O	SDRAM ENC, Bidirectional buffer
25	VDD	VDD	–	1.2V LOGIC power supply	80	VDD3	VDD3	–	3.3V I/O power supply
26	AC27	WM1DIO[1]	I/O	WM/VWM, Bidirectional buffer	81	N28	EDATA[0]	I/O	SDRAM ENC, Bidirectional buffer
27	GND	GND	–	Ground	82	N27	EDATA[1]	I/O	SDRAM ENC, Bidirectional buffer
28	AC28	WMCLKO	O	WM/VWM, Output buffer	83	N26	EDATA[2]	I/O	SDRAM ENC, Bidirectional buffer
29	VDD3	VDD3	–	3.3V I/O power supply	84	VDD	VDD	–	1.2V LOGIC power supply
30	AB26	WM1DIO[0]	I/O	WM/VWM, Bidirectional buffer	85	N25	EDATA[13]	I/O	SDRAM ENC, Bidirectional buffer
31	AA25	WM2DIO[7]	O	WM/VWM, Output buffer	86	GND	GND	–	Ground
32	AB27	WM2DIO[6]	O	WM/VWM, Output buffer	87	M28	EDATA[3]	I/O	SDRAM ENC, Bidirectional buffer
33	AB28	VDD	–	1.2V LOGIC power supply	88	GND	GND	–	Ground
34	Y24	WM2DIO[5]	O	WM/VWM, Output buffer	89	N24	EDATA[14]	I/O	SDRAM ENC, Bidirectional buffer
35	AA27	WM2DIO[4]	O	WM/VWM, Output buffer	90	M27	EDATA[4]	I/O	SDRAM ENC, Bidirectional buffer
36	AA26	WM2DIO[3]	O	WM/VWM, Output buffer	91	M26	EDATA[5]	I/O	SDRAM ENC, Bidirectional buffer
37	AA28	WM2DIO[2]	O	WM/VWM, Output buffer	92	VDD3	VDD3	–	3.3V I/O power supply
38	W24	WM2DIO[1]	O	WM/VWM, Output buffer	93	M25	EDATA[11]	I/O	SDRAM ENC, Bidirectional buffer
39	GND	GND	–	Ground	94	L28	EDATA[6]	I/O	SDRAM ENC, Bidirectional buffer
40	Y25	WM2DIO[0]	O	WM/VWM, Output buffer	95	L27	EDATA[7]	I/O	SDRAM ENC, Bidirectional buffer
41	GND	GND	–	Ground	96	VDD	VDD	–	1.2V LOGIC power supply
42	Y26	SYNC	I/O	TS OUT, Bidirectional buffer	97	M24	EDATA[12]	I/O	SDRAM ENC, Bidirectional buffer
43	Y27	STREAM	I/O	TS OUT, Bidirectional buffer	98	GND	GND	–	Ground
44	Y28	PACKETEN	I/O	TS OUT, Bidirectional buffer	99	L26	EDATA[8]	I/O	SDRAM ENC, Bidirectional buffer
45	VDD3	VDD3	–	3.3V IO power supply	100	GND	GND	–	Ground
46	W25	TSRW	O	TS OUT, Output buffer	101	L25	EDATA[9]	I/O	SDRAM ENC, Bidirectional buffer
47	GND	GND	–	Ground	102	K28	EDQM	O	SDRAM ENC, Output buffer
48	V24	TSCLK	O	TS OUT, Output buffer	103	K27	EWE	O	SDRAM ENC, Output buffer
49	VDD3	VDD3	–	3.3V I/O power supply	104	VDD3	VDD3	–	3.3V I/O power supply
50	W26	NBC10	–	Bias current adjustment terminal	105	K26	ECAS	O	SDRAM ENC, Output buffer
51	W27	VBGR10	I/O	Analog test bus (for debugging)	106	L24	EDATA[10]	I/O	SDRAM ENC, Bidirectional buffer
52	W28	AVDDAD10	–	ADC part analog power supply (3.3V)	107	K25	ECLKEN	O	Output buffer, 4/6mA
53	V25	AVSSAD10	–	ADC part analog Ground	108	VDD	VDD	–	1.2V LOGIC power supply
54	V27	CVBSIN	I	Analog Input	109	J28	ERAS	O	SDRAM ENC, Output buffer
55	U24	VRTD10	–	Input common bias	110	GND	GND	–	Ground

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No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
111	J27	ECS	O	SDRAM ENC, Output buffer	166	VDD3	VDD3	–	3.3V I/O power supply
112	GND	GND	–	Ground	167	C25	AT1DATA[11]	I/O	ATAPI-DVD, Bidirectional buffer
113	J26	EADRS[11]	O	SDRAM ENC, Output buffer	168	D24	AT1DATA[10]	I/O	ATAPI-DVD, Bidirectional buffer
114	J25	EADRS[8]	O	SDRAM ENC, Output buffer	169	E23	AT1DATA[9]	I/O	ATAPI-DVD, Bidirectional buffer
115	GND	GND	–	Ground	170	GND	GND	–	Ground
116	K24	ECLKO	O	SDRAM ENC, Output buffer	171	A26	AT1DATA[8]	I/O	ATAPI-DVD, Bidirectional buffer
117	VDD3	VDD3	–	3.3V I/O power supply	172	A25	AT1DATA[7]	I/O	ATAPI-DVD, Bidirectional buffer
118	H28	EBS[0]	O	SDRAM ENC, Output buffer	173	B25	AT1DATA[6]	I/O	ATAPI-DVD, Bidirectional buffer
119	H27	EBS[1]	O	SDRAM ENC, Output buffer	174	GND	GND	–	Ground
120	H26	EADRS[10]	O	SDRAM ENC, Output buffer	175	C24	AT1DATA[5]	I/O	ATAPI-DVD, Bidirectional buffer
121	VDD	VDD	–	1.2V LOGIC power supply	176	VDD3	VDD3	–	3.3V I/O power supply
122	G28	EADRS[0]	O	SDRAM ENC, Output buffer	177	E22	AT1DATA[4]	I/O	ATAPI-DVD, Bidirectional buffer
123	GND	GND	–	Ground	178	VDD	VDD	–	1.2V LOGIC power supply
124	J24	EADRS[9]	O	SDRAM ENC, Output buffer	179	D23	AT1DATA[3]	I/O	ATAPI-DVD, Bidirectional buffer
125	GND	GND	–	Ground	180	A24	AT1DATA[2]	I/O	ATAPI-DVD, Bidirectional buffer
126	G27	EADRS[1]	O	SDRAM ENC, Output buffer	181	B24	AT1DATA[1]	I/O	ATAPI-DVD, Bidirectional buffer
127	H25	EADRS[6]	O	SDRAM ENC, Output buffer	182	GND	GND	–	Ground
128	G26	EADRS[2]	O	SDRAM ENC, Output buffer	183	C23	AT1DATA[0]	I/O	ATAPI-DVD, Bidirectional buffer
129	VDD3	VDD3	–	3.3V I/O power supply	184	D22	AT1RESET	O	Output buffer, 8mA
130	F27	EDATA[17]	I/O	SDRAM ENC, Bidirectional buffer	185	E21	AT1DMARQ	I	ATAPI-DVD, Input buffer
131	F28	EDATA[16]	I/O	SDRAM ENC, Bidirectional buffer	186	GND	GND	–	Ground
132	H24	EADRS[7]	O	SDRAM ENC, Output buffer	187	B23	AT1DMACK	O	ATAPI-DVD, Output buffer
133	VDD	VDD	–	1.2V LOGIC power supply	188	VDD3	VDD3	–	3.3V I/O power supply
134	G25	EADRS[4]	O	SDRAM ENC, Output buffer	189	A23	AT1DIOW	O	ATAPI-DVD, Output buffer
135	GND	GND	–	Ground	190	VDD	VDD	–	1.2V LOGIC power supply
136	F26	EDATA[30]	I/O	SDRAM ENC, Bidirectional buffer	191	C22	AT1DIOR	O	ATAPI-DVD, Output buffer
137	GND	GND	–	Ground	192	D21	AT1IORDY	I	ATAPI-DVD, Input buffer
138	E27	EDATA[19]	I/O	SDRAM ENC, Bidirectional buffer	193	B22	AT1INTRQ	I	ATAPI-DVD, Input buffer
139	E28	EDATA[18]	I/O	SDRAM ENC, Bidirectional buffer	194	GND	GND	–	Ground
140	F25	EDATA[31]	I/O	SDRAM ENC, Bidirectional buffer	195	E20	AT1ADR[2]	O	ATAPI-DVD, Output buffer
141	VDD3	VDD3	–	3.3V I/O power supply	196	A22	AT1ADR[1]	O	ATAPI-DVD, Output buffer
142	E26	EDATA[29]	I/O	SDRAM ENC, Bidirectional buffer	197	C21	AT1ADR[0]	O	ATAPI-DVD, Output buffer
143	G24	EADRS[5]	O	SDRAM ENC, Output buffer	198	GND	GND	–	Ground
144	D28	EDATA[20]	I/O	SDRAM ENC, Bidirectional buffer	199	B21	AT1CS[1]	O	ATAPI-DVD, Output buffer
145	VDD	VDD	–	1.2V LOGIC power supply	200	VDD3	VDD3	–	3.3V I/O power supply
146	D27	EDATA[21]	I/O	SDRAM ENC, Bidirectional buffer	201	A21	AT1CS[0]	O	ATAPI-DVD, Output buffer
147	GND	GND	–	Ground	202	VDD	VDD	–	1.2V LOGIC power supply
148	C28	EDATA[22]	I/O	SDRAM ENC, Bidirectional buffer	203	E19	AT2DATA[15]	I/O	ATAPI-HDD, Bidirectional buffer
149	GND	GND	–	Ground	204	D20	AT2DATA[14]	I/O	ATAPI-HDD, Bidirectional buffer
150	F24	EADRS[3]	O	SDRAM ENC, Output buffer	205	C20	AT2DATA[13]	I/O	ATAPI-HDD, Bidirectional buffer
151	E25	EDATA[28]	I/O	SDRAM ENC, Bidirectional buffer	206	GND	GND	–	Ground
152	D26	EDATA[26]	I/O	SDRAM ENC, Bidirectional buffer	207	B20	AT2DATA[12]	I/O	ATAPI-HDD, Bidirectional buffer
153	VDD3	VDD3	–	3.3V I/O power supply	208	A20	AT2DATA[11]	I/O	ATAPI-HDD, Bidirectional buffer
154	B28	EDATA[23]	I/O	SDRAM ENC, Bidirectional buffer	209	D19	AT2DATA[10]	I/O	ATAPI-HDD, Bidirectional buffer
155	C27	EDATA[25]	I/O	SDRAM ENC, Bidirectional buffer	210	GND	GND	–	Ground
156	B27	EDATA[24]	I/O	SDRAM ENC, Bidirectional buffer	211	E18	AT2DATA[9]	I/O	ATAPI-HDD, idirectional buffer
157	VDD	VDD	–	1.2V LOGIC power supply	212	VDD3	VDD3	–	3.3V I/O power supply
158	D25	EDATA[27]	I/O	SDRAM ENC, Bidirectional buffer	213	C19	AT2DATA[8]	I/O	ATAPI-HDD, Bidirectional buffer
159	GND	GND	–	Ground	214	VDD	VDD	–	1.2V LOGIC power supply
160	C26	AT1DATA[15]	I/O	ATAPI-DVD, Bidirectional buffer	215	B19	AT2DATA[7]	I/O	ATAPI-HDD, Bidirectional buffer
161	E24	AT1DATA[14]	I/O	ATAPI-DVD, Bidirectional buffer	216	A19	AT2DATA[6]	I/O	ATAPI-HDD, Bidirectional buffer
162	GND	GND	–	Ground	217	D18	AT2DATA[5]	I/O	ATAPI-HDD, Bidirectional buffer
163	A28	VDD	–	1.2V LOGIC power supply	218	GND	GND	–	Ground
164	B26	AT1DATA[13]	I/O	ATAPI-DVD, Bidirectional buffer	219	C18	AT2DATA[4]	I/O	ATAPI-HDD, Bidirectional buffer
165	A27	AT1DATA[12]	I/O	ATAPI-DVD, Bidirectional buffer	220	E17	AT2DATA[3]	I/O	ATAPI-HDD, Bidirectional buffer

F

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
221	B18	AT2DATA[2]	I/O	ATAPI-HDD, Bidirectional buffer	276	VDD3	VDD3	–	3.3V I/O power supply
222	GND	GND	–	Ground	277	C11	AMCLK2	I	CLOCK, Input buffer
223	A18	AT2DATA[1]	I/O	ATAPI-HDD, Bidirectional buffer	278	GND	GND	–	Ground
224	VDD3	VDD3	–	3.3V I/O power supply	279	D11	ARDATA[1]	I/O	SDRAM-ATAPI, Bidirectional buffer
225	D17	AT2DATA[0]	I/O	ATAPI-HDD, Bidirectional buffer	280	VDD3	VDD3	–	3.3V I/O power supply
226	VDD	VDD	–	1.2V LOGIC power supply	281	A10	ARDATA[14]	I/O	SDRAM-ATAPI, Bidirectional buffer
227	C17	AT2RESET	I/O	ATAPI-HDD, Bidirectional buffer	282	VDD	VDD	–	1.2V LOGIC power supply
228	B17	AT2DMARQ	I	ATAPI-HDD, Input buffer	283	B10	ARDATA[15]	I/O	SDRAM-ATAPI, Bidirectional buffer
229	E16	AT2DMACK	O	ATAPI-HDD, Output buffer	284	E11	ARDATA[0]	I/O	SDRAM-ATAPI, Bidirectional buffer
230	GND	GND	–	Ground	285	C10	ARDATA[4]	I/O	SDRAM-ATAPI, Bidirectional buffer
231	A17	AT2DIOW	O	ATAPI-HDD, Output buffer	286	GND	GND	–	Ground
232	D16	AT2DIOR	O	ATAPI-HDD, Output buffer	287	D10	ARDATA[3]	I/O	SDRAM-ATAPI, Bidirectional buffer
233	C16	AT2IORDY	I	ATAPI-HDD, Input buffer	288	A9	ARDATA[11]	I/O	SDRAM-ATAPI, Bidirectional buffer
234	GND	GND	–	Ground	289	B9	ARDATA[12]	I/O	SDRAM-ATAPI, Bidirectional buffer
235	B16	AT2INTRQ	I	ATAPI-HDD, Input buffer	290	GND	GND	–	Ground
236	VDD3	VDD3	–	3.3V I/O power supply	291	C9	ARDATA[13]	I/O	SDRAM-ATAPI, Bidirectional buffer
237	A16	AT2ADR[2]	I/O	ATAPI-HDD, Bidirectional buffer	292	E10	ARDATA[2]	I/O	SDRAM-ATAPI, Bidirectional buffer
238	VDD	VDD	–	1.2V LOGIC power supply	293	D9	ARDATA[6]	I/O	SDRAM-ATAPI, Bidirectional buffer
239	E15	AT2ADR[1]	I/O	ATAPI-HDD, Bidirectional buffer	294	VDD3	VDD3	–	3.3V I/O power supply
240	GND	GND	–	Ground	295	A8	ARDATA[10]	I/O	SDRAM-ATAPI, Bidirectional buffer
241	D15	AT2ADR[0]	I/O	ATAPI-HDD, Bidirectional buffer	296	B8	ARDATA[9]	I/O	SDRAM-ATAPI, Bidirectional buffer
242	VDD	VDD	–	1.2V LOGIC power supply	297	C8	ARWE	O	SDRAM-ATAPI, Output buffer
243	C15	AT2CS[1]	O	ATAPI-HDD, Output buffer	298	VDD	VDD	–	1.2V LOGIC power supply
244	GND	GND	–	Ground	299	A7	ARDATA[8]	I/O	SDRAM-ATAPI, Bidirectional buffer
245	B15	AT2CS[0]	O	ATAPI-HDD, Output buffer	300	E9	ARDATA[5]	I/O	SDRAM-ATAPI, Bidirectional buffer
246	VDD	VDD	–	1.2V LOGIC power supply	301	D8	ARDQM[0]	O	SDRAM-ATAPI, Output buffer
247	A15	AT2MODE	I	ATAPI-HDD, Input buffer	302	GND	GND	–	Ground
248	GND	GND	–	Ground	303	B7	ARDQM[1]	O	SDRAM-ATAPI, Output buffer
249	GND	GND	–	Ground	304	C7	ARCS[0]	O	SDRAM-ATAPI, Output buffer
250	A14	RESET	I	Input buffer (5V tolerant)	305	VDD3	VDD3	–	3.3V I/O power supply
251	VDD3	VDD3	–	3.3V I/O power supply	306	A6	ARCLKO	O	SDRAM-ATAPI, Output buffer
252	B14	VDD	–	1.2V LOGIC power supply	307	GND	GND	–	Ground
253	C14	DBI	I	TEST, Input buffer	308	B6	ARADRS[12]	O	SDRAM-ATAPI, Output buffer
254	GND	GND	–	Ground	309	E8	ARDATA[7]	I/O	SDRAM-ATAPI, Bidirectional buffer
255	D14	TRACE	I	TEST, Input buffer	310	D7	ARRAS	O	SDRAM-ATAPI, Output buffer
256	E14	VDD	–	1.2V LOGIC power supply	311	VDD3	VDD3	–	3.3V I/O power supply
257	A13	PCO	O	CLOCK, 3 state output buffer	312	A5	ARADRS[11]	O	SDRAM-ATAPI, Output buffer
258	GND	GND	–	Ground	313	C6	ARADRS[13]	O	SDRAM-ATAPI, Output buffer
259	B13	PLL3AVSS	–		314	B5	ARADRS[9]	O	SDRAM-ATAPI, Output buffer
260	C13	PLL3AVDD	–		315	VDD	VDD	–	1.2V LOGIC power supply
261	D13	VMCLK	I	CLOCK, Input buffer	316	E7	ARCAS	O	SDRAM-ATAPI, Output buffer
262	E13	PLL1AVDD	–		317	D6	ARADRS[14]	O	SDRAM-ATAPI, Output buffer
263	A12	PLL1AVSS	–		318	C5	ARADRS[1]	O	SDRAM-ATAPI, Output buffer
264	VDD3	VDD3	–	3.3V I/O power supply	319	GND	GND	–	Ground
265	B12	ADCCLKO	O	CLOCK, Output buffer	320	B4	ARADRS[3]	O	SDRAM-ATAPI, Output buffer
266	GND	GND	–	Ground	321	A4	ARADRS[8]	O	SDRAM-ATAPI, Output buffer
267	C12	VDD	–	1.2V LOGIC power supply	322	A3	ARADRS[7]	O	SDRAM-ATAPI, Output buffer
268	VDD3	VDD3	–	3.3V I/O power supply	323	GND	GND	–	Ground
269	D12	DVAMCLKO	O	CLOCK, Output buffer	324	E6	ARCS[1]	O	SDRAM-ATAPI, Output buffer
270	GND	GND	–	Ground	325	D5	ARADRS[0]	O	SDRAM-ATAPI, Output buffer
271	A11	DACCLKO	O	CLOCK, Output buffer	326	C4	ARADRS[2]	O	SDRAM-ATAPI, Output buffer
272	VDD3	VDD3	–	3.3V I/O power supply	327	VDD3	VDD3	–	3.3V I/O power supply
273	E12	DVAMCLKI	I	AUDIO CLOCK, Input buffer	328	A2	ARADRS[5]	O	SDRAM-ATAPI, Output buffer
274	GND	GND	–	Ground	329	B3	ARADRS[6]	O	SDRAM-ATAPI, Output buffer
275	B11	AMCLK1	I	CLOCK, Input buffer	330	B2	ARADRS[4]	O	SDRAM-ATAPI, Output buffer

A

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
331	GND	GND	–	Ground	386	VDD	VDD	–	1.2V LOGIC power supply
332	E5	ARADRS[10]	O	SDRAM-ATAPI, Output buffer	387	GND	GND	–	Ground
333	D4	SRCBCKI	I	AUDIO, Input buffer	388	L3	SPIDATAI	I/O	HOST, Bidirectional buffer
334	VDD3	VDD3	–	3.3V I/O power supply	389	VDD	VDD	–	1.2V LOGIC power supply
335	C3	SRCLRCKI	I	AUDIO, Input buffer	390	M5	SPIDATAO	I/O	HOST, Bidirectional buffer
336	B1	SRCDATAI	I	AUDIO, Input buffer	391	GND	GND	–	Ground
337	A1	VDD	–	1.2V LOGIC power supply	392	L2	SPICLK	I/O	HOST, Bidirectional buffer
338	GND	GND	–	Ground	393	GND	GND	–	Ground
339	C2	SRCBCKO	O	AUDIO, Output buffer	394	L1	DDATA[0]	I/O	SDRAM-DEC, Bidirectional buffer
340	VDD	VDD	–	1.2V LOGIC power supply	395	VDD3	VDD3	–	3.3V I/O power supply
341	D3	SRCLRCKO	O	AUDIO, Output buffer	396	M4	DDATA[14]	I/O	SDRAM-DEC, Bidirectional buffer
342	E4	SRCDATAO	O	AUDIO, Output buffer	397	M3	DDATA[15]	I/O	SDRAM-DEC, Bidirectional buffer
343	F5	SPDIFI	I	AUDIO, Input buffer	398	M2	DDATA[2]	I/O	SDRAM-DEC, Bidirectional buffer
344	D2	SPDIFO	O	AUDIO, Output buffer	399	VDD	VDD	–	1.2V LOGIC power supply
345	C1	DVLRCK	I/O	AUDIO, Bidirectional buffer	400	N5	DDATA[11]	I/O	SDRAM-DEC, Bidirectional buffer
346	E3	DVBCK	I/O	AUDIO, Bidirectional buffer	401	GND	GND	–	Ground
347	D1	DVADATA	I/O	AUDIO, Bidirectional buffer	402	M1	DDATA[1]	I/O	SDRAM-DEC, Bidirectional buffer
348	F4	ACMOD[1]	I	AUDIO, Input buffer	403	GND	GND	–	Ground
349	G5	ACMOD[0]	I	AUDIO, Input buffer	404	N4	DDATA[12]	I/O	SDRAM-DEC, Bidirectional buffer
350	E1	LRCKI	I	AUDIO, Input buffer	405	N3	DDATA[13]	I/O	SDRAM-DEC, Bidirectional buffer
351	E2	BCKI	I	AUDIO, Input buffer	406	N2	DDATA[3]	I/O	SDRAM-DEC, Bidirectional buffer
352	GND	GND	–	Ground	407	VDD3	VDD3	–	3.3V I/O power supply
353	F3	ADATAI	I	AUDIO, Input buffer	408	N1	DDATA[4]	I/O	SDRAM-DEC, Bidirectional buffer
354	GND	GND	–	Ground	409	P5	DDATA[8]	I/O	SDRAM-DEC, Bidirectional buffer
355	G4	LRCKO	O	AUDIO, Output buffer	410	P4	DDATA[9]	I/O	SDRAM-DEC, Bidirectional buffer
356	VDD	VDD	–	1.2V LOGIC power supply	411	VDD	VDD	–	1.2V LOGIC power supply
357	H5	BCKO	O	AUDIO, Output buffer	412	P3	DDATA[10]	I/O	SDRAM-DEC, Bidirectional buffer
358	F1	ADATAO	O	DVD-AUDIO, Output buffer	413	GND	GND	–	Ground
359	F2	DVDADT[7]	O	DVD-AUDIO, Output buffer	414	P2	DDATA[6]	I/O	SDRAM-DEC, Bidirectional buffer
360	G2	DVDADT[6]	O	DVD-AUDIO, Output buffer	415	GND	GND	–	Ground
361	G3	DVDADT[5]	O	DVD-AUDIO, Output buffer	416	P1	DDATA[5]	I/O	SDRAM-DEC, Bidirectional buffer
362	J5	DVDADT[4]	O	DVD-AUDIO, Output buffer	417	R1	DDATA[7]	I/O	SDRAM-DEC, Bidirectional buffer
363	H4	DVDADT[3]	O	DVD-AUDIO, Output buffer	418	R2	DDQM[0]	O	SDRAM-DEC, Output buffer
364	G1	DVDADT[2]	O	DVD-AUDIO, Output buffer	419	VDD3	VDD3	–	3.3V I/O power supply
365	H3	DVDADT[1]	O	DVD-AUDIO, Output buffer	420	R3	DWE	O	SDRAM-DEC, Output buffer
366	H2	DVDADT[0]	O	DVD-AUDIO, Output buffer	421	VDD	VDD	–	1.2V LOGIC power supply
367	H1	DVDAADR[1]	O	DVD-AUDIO, Output buffer	422	R4	DDQM[1]	O	SDRAM-DEC, Output buffer
368	K5	DVDAADR[0]	O	DVD-AUDIO, Output buffer	423	GND	GND	–	Ground
369	J4	DVDAREQ	I/O	DVD-AUDIO, Bidirectional buffer	424	R5	DCLKO	O	SDRAM-DEC, Output buffer
370	GND	GND	–	Ground	425	VDD3	VDD3	–	3.3V I/O power supply
371	J3	DVDAACK	O	DVD-AUDIO, Output buffer	426	VDD	VDD	–	1.2V LOGIC power supply
372	VDD	VDD	–	1.2V LOGIC power supply	427	T1	DCAS	O	SDRAM-DEC, Output buffer
373	J2	SCICS[1]	I/O	HOST, Bidirectional buffer	428	GND	GND	–	Ground
374	VDD3	VDD3	–	3.3V I/O power supply	429	T2	DRAS	–	SDRAM-DEC, Output buffer
375	J1	SCICS[0]	I/O	HOST, Bidirectional buffer	430	GND	GND	–	Ground
376	VDD	VDD	–	1.2V LOGIC power supply	431	T3	DCS	O	SDRAM-DEC, Output buffer
377	K4	SCIDATA[1]	I/O	HOST, Bidirectional buffer	432	T4	DADRS[11]	O	SDRAM-DEC, Output buffer
378	GND	GND	–	Ground	433	U1	DBS[0]	O	SDRAM-DEC, Output buffer
379	L5	SCIDATA[0]	I/O	HOST, Bidirectional buffer	434	VDD3	VDD3	–	3.3V I/O power supply
380	K3	VDD	–	1.2V LOGIC power supply	435	T5	DADRS[9]	O	SDRAM-DEC, Output buffer
381	K2	SCICLK[1]	I/O	HOST, Bidirectional buffer	436	U2	DBS[1]	O	SDRAM-DEC, Output buffer
382	GND	GND	–	Ground	437	U3	DADRS[10]	O	SDRAM-DEC, Output buffer
383	K1	SCICLK[0]	I/O	HOST, Bidirectional buffer	438	VDD	VDD	–	1.2V LOGIC power supply
384	GND	GND	–	Ground	439	U4	DADRS[7]	O	SDRAM-DEC, Output buffer
385	L4	SPICS	I/O	HOST, Bidirectional buffer	440	GND	GND	–	Ground

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No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
441	V1	DADRS[0]	O	SDRAM-DEC, Output buffer	496	VDD	VDD	–	1.2V LOGIC power supply
442	GND	GND	–	Ground	497	AD4	HDACK[0]	O	Output buffer, 4mA
443	V2	DADRS[1]	O	SDRAM-DEC, Output buffer	498	AF1	HDREQ[1]	I	HOST, Input buffer
444	VDD	VDD	–	1.2V LOGIC power supply	499	AE3	HDREQ[0]	I	HOST, Input buffer
445	U5	DADRS[8]	O	SDRAM-DEC, Output buffer	500	AC5	HWAIT	I	HOST, Input buffer
446	GND	GND	–	Ground	501	AF2	HOE	O	HOST, Output buffer
447	V3	DADRS[5]	O	SDRAM-DEC, Output buffer	502	VDD3	VDD3	–	3.3V I/O power supply
448	VDD3	VDD3	–	3.3V I/O power supply	503	GND	GND	–	Ground
449	V4	DADRS[6]	O	SDRAM-DEC, Output buffer	504	AE4	VDD	–	1.2V LOGIC power supply
450	W1	DADRS[3]	O	SDRAM-DEC, Output buffer	505	AD5	HCS[5]	O	HOST, Output buffer
451	W2	DADRS[2]	O	SDRAM-DEC, Output buffer	506	AG2	HCS[4]	O	HOST, Output buffer
452	VDD	VDD	–	1.2V LOGIC power supply	507	AF3	HCS[3]	O	HOST, Output buffer
453	W3	DADRS[4]	O	SDRAM-DEC, Output buffer	508	AG3	HCS[2]	O	HOST, Output buffer
454	GND	GND	–	Ground	509	AH2	HCS[1]	O	HOST, Output buffer
455	GND	GND	–	Ground	510	GND	GND	–	Ground
456	GND	GND	–	Ground	511	AF4	HCS[0]	O	HOST, Output buffer
457	V5	INT[7]	I/O	HOST, Bidirectional buffer	512	VDD	VDD	–	1.2V LOGIC power supply
458	VDD	VDD	–	1.2V LOGIC power supply	513	AD6	HADRS[10]	I/O	HOST, Bidirectional buffer
459	W4	INT[6]	I/O	HOST, Bidirectional buffer	514	GND	GND	–	Ground
460	Y1	INT[5]	I/O	HOST, Bidirectional buffer	515	AE5	HADRS[11]	I/O	HOST, Bidirectional buffer
461	Y2	INT[4]	I/O	HOST, Bidirectional buffer	516	AG4	HADRS[13]	I/O	HOST, Bidirectional buffer
462	VDD3	VDD3	–	3.3V I/O power supply	517	AH3	HADRS[30]	I/O	HOST, Bidirectional buffer
463	Y3	INT[3]	I/O	HOST, Bidirectional buffer	518	VDD3	VDD3	–	3.3V I/O power supply
464	GND	GND	–	Ground	519	AF5	HADRS[12]	I/O	HOST, Bidirectional buffer
465	Y4	INT[2]	I/O	HOST, Bidirectional buffer	520	GND	GND	–	Ground
466	VDD	VDD	–	1.2V LOGIC power supply	521	AH4	HADRS[14]	I/O	HOST, Bidirectional buffer
467	W5	INT[1]	I/O	HOST, Bidirectional buffer	522	AE6	HDATA[1]	I/O	HOST, Bidirectional buffer
468	AA1	INT[0]	I/O	HOST, Bidirectional buffer	523	AD7	HADRS[9]	I/O	HOST, Bidirectional buffer
469	AA2	SCLK[1]	I/O	HOST, Bidirectional buffer	524	VDD3	VDD3	–	3.3V I/O power supply
470	AA3	SCLK[0]	I/O	HOST, Bidirectional buffer	525	AG5	HDATA[15]	I/O	HOST, Bidirectional buffer
471	AB1	CTS[3]	I/O	HOST, Bidirectional buffer	526	GND	GND	–	Ground
472	GND	GND	–	Ground	527	AH5	HDATA[14]	I/O	HOST, Bidirectional buffer
473	Y5	CTS[2]	I/O	HOST, Bidirectional buffer	528	GND	GND	–	Ground
474	GND	GND	–	Ground	529	AF6	HDATA[0]	I/O	HOST, Bidirectional buffer
475	AA4	CTS[1]	I/O	HOST, Bidirectional buffer	530	AD8	HDATA[6]	I/O	HOST, Bidirectional buffer
476	VDD	VDD	–	1.2V LOGIC power supply	531	AE7	HDATA[2]	I/O	HOST, Bidirectional buffer
477	AB3	CTS[0]	I/O	HOST, Bidirectional buffer	532	VDD3	VDD3	–	3.3V I/O power supply
478	AB2	RTS[3]	I/O	HOST, Bidirectional buffer	533	AG6	HDATA[12]	I/O	HOST, Bidirectional buffer
479	AC2	RTS[2]	I/O	HOST, Bidirectional buffer	534	VDD	VDD	–	1.2V LOGIC power supply
480	AC1	RTS[1]	I/O	HOST, Bidirectional buffer	535	AH6	HDATA[13]	I/O	HOST, Bidirectional buffer
481	AA5	RTS[0]	I/O	HOST, Bidirectional buffer	536	AG7	HDATA[11]	I/O	HOST, Bidirectional buffer
482	VDD3	VDD3	–	3.3V I/O power supply	537	AF7	HDATA[3]	I/O	HOST, Bidirectional buffer
483	AB4	RX[3]	I/O	HOST, Bidirectional buffer	538	GND	GND	–	Ground
484	GND	GND	–	Ground	539	AE8	HDATA[5]	I/O	HOST, Bidirectional buffer
485	AC3	RX[2]	I/O	HOST, Bidirectional buffer	540	GND	GND	–	Ground
486	VDD	VDD	–	1.2V LOGIC power supply	541	AD9	HDATA[7]	I/O	HOST, Bidirectional buffer
487	AD2	RX[1]	I/O	HOST, Bidirectional buffer	542	AF8	HDATA[4]	I/O	HOST, Bidirectional buffer
488	AD1	RX[0]	I/O	HOST, Bidirectional buffer	543	AH7	HDATA[10]	I/O	HOST, Bidirectional buffer
489	AB5	TX[3]	I/O	HOST, Bidirectional buffer	544	VDD3	VDD3	–	3.3V I/O power supply
490	AC4	TX[2]	I/O	HOST, Bidirectional buffer	545	AG8	HDATA[8]	I/O	HOST, Bidirectional buffer
491	AD3	TX[1]	I/O	HOST, Bidirectional buffer	546	VDD	VDD	–	1.2V LOGIC power supply
492	GND	GND	–	Ground	547	AH8	HDATA[9]	I/O	HOST, Bidirectional buffer
493	AE1	TX[0]	I/O	HOST, Bidirectional buffer	548	AE9	HDWE	O	HOST, Output buffer
494	GND	GND	–	Ground	549	AF9	DQMWS[0]	O	HOST, Output buffer
495	AE2	HDACK[1]	O	HOST, Output buffer	550	GND	GND	–	Ground

A

No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
551	AD10	HDCS[1]	O	HOST, Output buffer	606	AG16	TMS	I	TEST, nput buffer
552	GND	GND	–	Ground	607	GND	GND	–	Ground
553	AG9	DQMWS[1]	O	HOST, Output buffer	608	AF16	TDO	O	TEST, Output buffer
554	VDD3	VDD3	–	3.3V I/O power supply	609	VDD	VDD	–	1.2V LOGIC power supply
555	AH9	HCLKO	O	HOST, Output buffer	610	AE16	TDI	I	TEST, Input buffer
556	GND	GND	–	Ground	611	VDD3	VDD3	–	3.3V I/O power supply
557	AE10	HDCS[0]	O	HOST, Output buffer	612	AH17	TRST	I	TEST, Input buffer
558	VDD3	VDD3	–	3.3V I/O power supply	613	GND	GND	–	Ground
559	AD11	HADRS[15]	I/O	HOST, Bidirectional buffer	614	AD16	TCK	I	TEST, Input buffer
560	VDD	VDD	–	1.2V LOGIC power supply	615	VDD3	VDD3	–	3.3V I/O power supply
561	AF10	HCAS	O	HOST, Output buffer	616	AG17	PLLST	I	CLOCK, Input buffer
562	AG10	HRAS	O	HOST, Output buffer	617	GND	GND	–	Ground
563	AH10	HCLKEN	O	HOST, Output buffer	618	AF17	DVCLKO	O	CLOCK, Output buffer
564	GND	GND	–	Groud	619	VDD3	VDD3	–	3.3V I/O power supply
565	AE11	HADRS[16]	I/O	HOST, Bidirectional buffer	620	AE17	PXCLK	O	CLOCK, Output buffer
566	GND	GND	–	Ground	621	GND	GND	–	Ground
567	AF11	HADRS[17]	I/O	HOST, Bidirectional buffer	622	AH18	REC656I[7]	I	VIDEO-Digital, Input buffer
568	AD12	HADRS[27]	I/O	HOST, Bidirectional buffer	623	VDD	VDD	–	1.2V LOGIC power supply
569	AG11	HADRS[20]	I/O	HOST, Bidirectional buffer	624	AG18	REC656I[6]	I	VIDEO-Digital, Input buffer
570	VDD3	VDD3	–	3.3V I/O power supply	625	GND	GND	–	Ground
571	AH11	HADRS[21]	I/O	HOST, Bidirectional buffer	626	AD17	REC656I[5]	I	VIDEO-Digital, Input buffer
572	VDD	VDD	–	1.2V LOGIC power supply	627	AF18	REC656I[4]	I	VIDEO-Digital, Input buffer
573	AE12	HADRS[19]	I/O	HOST, Bidirectional buffer	628	AE18	REC656I[3]	I	VIDEO-Digital, Input buffer
574	AF12	HADRS[18]	I/O	HOST, Bidirectional buffer	629	AH19	REC656I[2]	I	VIDEO-Digital, Input buffer
575	AG12	HADRS[23]	I/O	HOST, Bidirectional buffer	630	AG19	REC656I[1]	I	VIDEO-Digital, Input buffer
576	GND	GND	–	Ground	631	AF19	REC656I[0]	I	VIDEO-Digital, Input buffer
577	AD13	HADRS[28]	I/O	HOST, Bidirectional buffer	632	AH20	DVVIDEO[7]	I/O	VIDEO-Digital, Bidirectional buffer
578	VDD	VDD	–	1.2V LOGIC power supply	633	AD18	DVVIDEO[6]	I/O	VIDEO-Digital, Bidirectional buffer
579	AH12	HADRS[22]	I/O	HOST, Bidirectional buffer	634	AE19	DVVIDEO[5]	I/O	VIDEO-Digital, Bidirectional buffer
580	GND	GND	–	Ground	635	VDD3	VDD3	–	3.3V I/O power supply
581	AE13	HADRS[29]	I/O	HOST, Bidirectional buffer	636	AG20	DVCLKI	I	CLOCK, Input buffer
582	VDD	VDD	–	1.2V LOGIC power supply	637	AF20	PLL2AVDD	–	
583	AF13	HADRS[24]	I/O	HOST, Bidirectional buffer	638	AH21	PLL2AVSS	–	
584	VDD3	VDD3	–	3.3V I/O power supply	639	AD19	R656CLKI	I	CLOCK, Input buffer
585	AG13	HADRS[25]	I/O	HOST, Bidirectional buffer	640	GND	GND	–	Ground
586	GND	GND	–	Ground	641	AE20	ADMCLKI	I	CLOCKI, Input buffer
587	AH13	HADRS[26]	I/O	HOST, Bidirectional buffer	642	VDD3	VDD3	–	3.3V I/O power supply
588	GND	GND	–	Ground	643	AG21	DVVIDEO[4]	I/O	VIDEO-Digital, Bidirectional buffer
589	GND	GND	–	Ground	644	AF21	DVVIDEO[3]	I/O	VIDEO-Digital, Bidirectional buffer
590	AD14	TESTMOD[6]	I	TEST, Input buffer	645	AD20	DVVIDEO[2]	I/O	VIDEO-Digital, Bidirectional buffer
591	AE14	VDD	–	1.2V LOGIC power supply	646	AH22	DVVIDEO[1]	I/O	VIDEO-Digital, Bidirectional buffer
592	AF14	TESTMOD[5]	I	TEST, Input buffer	647	AG22	DVVIDEO[0]	I/O	VIDEO-Digital, Bidirectional buffer
593	GND	GND	–	Ground	648	AE21	REC656O[7]	O	VIDEO-Digital, Output buffer
594	AG14	TESTMOD[4]	I	TEST, Input buffer	649	AF22	REC656O[6]	O	VIDEO-Digital, Output buffer
595	VDD	VDD	–	1.2V LOGIC power supply	650	VDD	VDD	–	1.2V LOGIC power supply
596	AH14	TESTMOD[3]	I	TEST, Input buffer	651	AH23	DVREQ	I	VIDEO-Digital, Input buffer
597	GND	GND	–	Ground	652	GND	GND	–	Ground
598	AH15	TESTMOD[2]	I	TEST, Input buffer	653	AG23	DVACK	O	VIDEO-Digital, Output buffer
599	VDD	VDD	–	1.2V LOGIC power supply	654	GND	GND	–	Ground
600	AG15	TESTMOD[1]	I	TEST, Input buffer	655	AE22	AVSS1DA10	–	
601	GND	GND	–	Ground	656	AD21	GOUT	O	VIDEO-Analog
602	AF15	TESTMOD[0]	I	TEST, Input buffer	657	AH24	AVDD1DA10	–	
603	AE15	CSYNC	I	CLOCK, Input buffer	658	AF23	BOUT	O	VIDEO-Analog
604	AD15	VIPWM	O	CLOCK, Output buffer	659	AE23	AVDD1DA10	–	
605	AH16	PLLON	I	TEST, Input buffer	660	AG24	ROUT	O	VIDEO-Analog

F

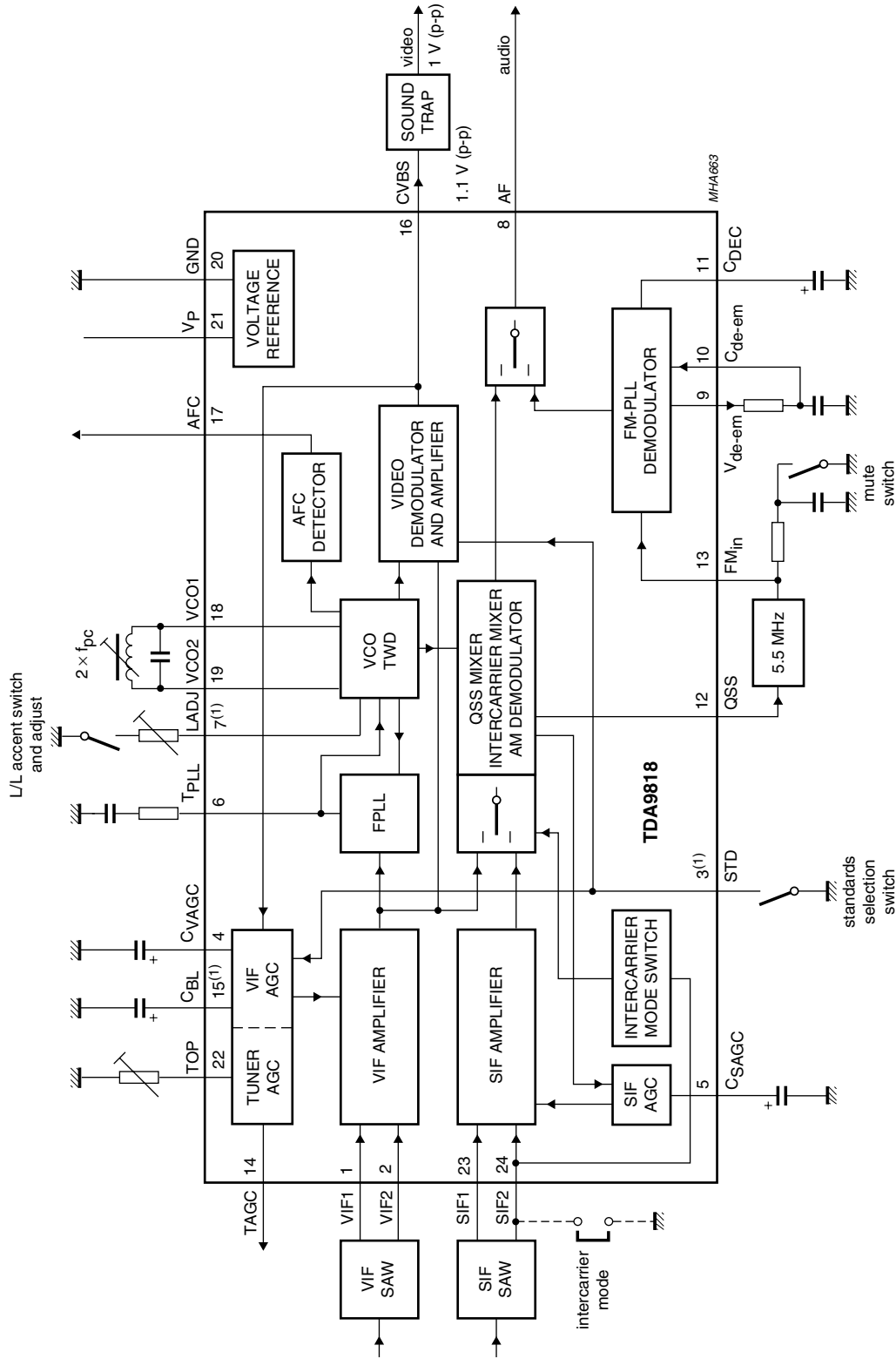
No.	BALL Address	Pin Name	I/O	Function	No.	BALL Address	Pin Name	I/O	Function
661	AD22	IREF[0]	–	VIDEO-Analog	669	AD23	REC656O[4]	O	VIDEO-Digital, Output buffer
662	AF24	IREF[1]	–	VIDEO-Analog	670	AH27	REC656O[3]	O	VIDEO-Digital, Output buffer
663	AG25	YOUT	O	VIDEO-Analog	671	AG26	REC656O[2]	O	VIDEO-Digital, Output buffer
664	AH25	AVSS2DA10	–		672	AG27	REC656O[1]	O	VIDEO-Digital, Output buffer
665	AE24	COUT	O	VIDEO-Analog	673	GND	GND	–	Ground
666	AH26	AVDD2DA10	–		674	AD24	REC656O[0]	O	VIDEO-Digital, Output buffer
667	GND	GND	–	Ground	675	AE25	AGCCTL	O	VIDEO-Analog
668	AF25	REC656O[5]	O	VIDEO-Digital, Output buffer					

● Others

BALL Address	Pin Name	BALL Address	Pin Name	BALL Address	Pin Name	BALL Address	Pin Name
AA23	GND	P12	GND	AC11	VDD	AB23	VDD3
AA6	GND	P13	GND	AC14	VDD	AB6	VDD3
AC12	GND	P14	GND	AC6	VDD	AC10	VDD3
AC17	GND	P15	GND	AC8	VDD	AC13	VDD3
AC20	GND	P16	GND	L6	VDD	AC16	VDD3
AC9	GND	P17	GND	AC11	VDD	AC19	VDD3
F11	GND	R12	GND	AC14	VDD	AC22	VDD3
F14	GND	R13	GND	AC6	VDD	AC7	VDD3
F17	GND	R14	GND	AC8	VDD	F10	VDD3
F20	GND	R15	GND	L6	VDD	F13	VDD3
F23	GND	R16	GND	P6	VDD	F16	VDD3
F8	GND	R17	GND	U6	VDD	F19	VDD3
H6	GND	R23	GND	Y6	VDD	F22	VDD3
J23	GND	R6	GND	F12	VDD	F7	VDD3
M12	GND	T12	GND	F6	VDD	G23	VDD3
M13	GND	T13	GND	F9	VDD	G6	VDD3
M14	GND	T14	GND	J6	VDD	K23	VDD3
M15	GND	T15	GND	AC15	VDD	K6	VDD3
M16	GND	T16	GND	AC18	VDD	N23	VDD3
M17	GND	T17	GND	AC21	VDD	N6	VDD3
M23	GND	U12	GND	AC23	VDD	T23	VDD3
M6	GND	U13	GND	F15	VDD	T6	VDD3
N12	GND	U14	GND	F18	VDD	W23	VDD3
N13	GND	U15	GND	F21	VDD	W6	VDD3
N14	GND	U16	GND	H23	VDD		
N15	GND	U17	GND	L23	VDD		
N16	GND	V23	GND	P23	VDD		
N17	GND	V6	GND	U23	VDD		
				Y23	VDD		

TDA9818TS (TUNB ASSY : IC302)

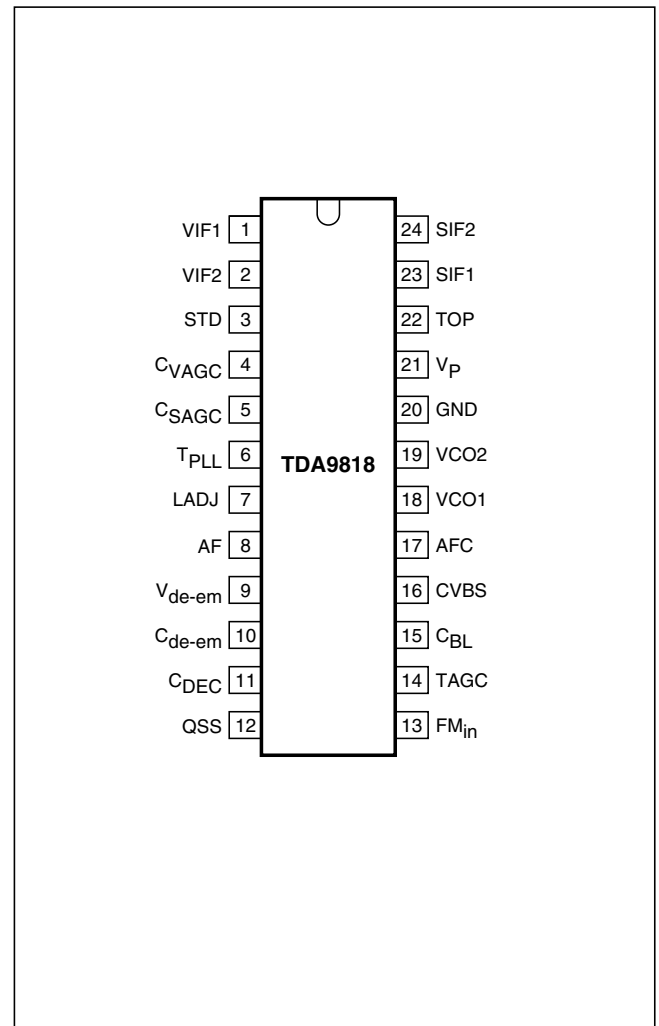
• VIF/SIF IC



● PIN FUNCTION

SYMBOL	PIN	DESCRIPTION
VIF1	1	VIF differential input signal voltage 1
VIF2	2	VIF differential input signal voltage 2
STD	3	standards selection switch; note 1
C _{VAGC}	4	VIF AGC capacitor
C _{SAGC}	5	SIF AGC capacitor
T _{PLL}	6	PLL filter
LADJ	7	L/L accent switch and adjust
AF	8	audio output
V _{de-em}	9	de-emphasis output
C _{de-em}	10	de-emphasis input
C _{DEC}	11	decoupling capacitor
QSS	12	single reference QSS/intercarrier output voltage
FM _{in}	13	sound intercarrier input voltage
TAGC	14	tuner AGC output
C _{BL}	15	black level detector
CVBS	16	composite video output voltage
AFC	17	AFC output
VCO1	18	VCO1 resonance circuit
VCO2	19	VCO2 resonance circuit
GND	20	ground
V _P	21	supply voltage
TOP	22	tuner AGC takeover point adjust
SIF1	23	SIF differential input signal voltage 1
SIF2	24	SIF differential input signal voltage 2

● PIN LAYOUT



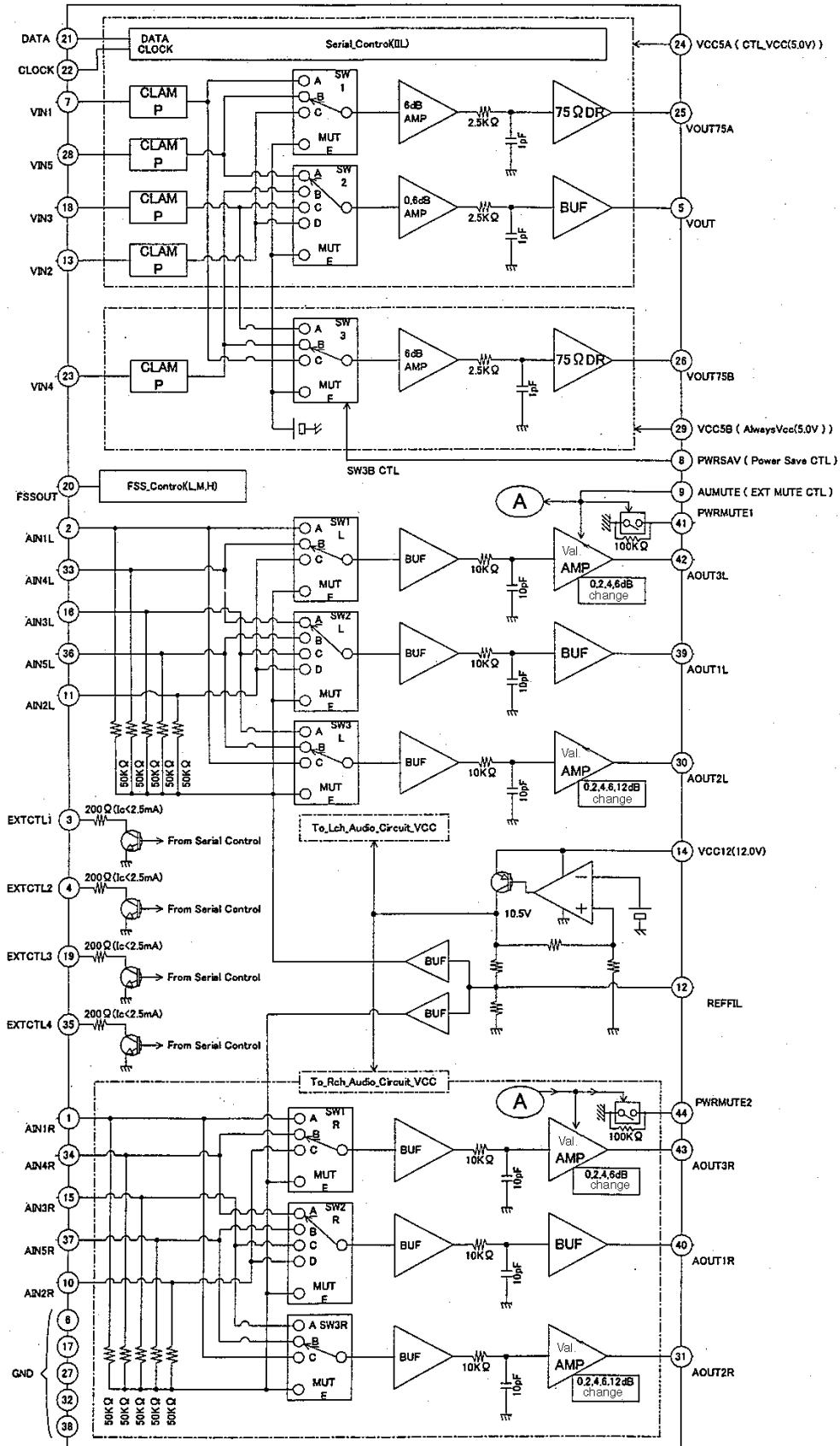
LA73026AV (JCKB ASSY : IC501)

• Dual SCART Interface IC

● Pin Function

No.	Pin Name	DC Voltage	Function
1 2 10 11 15 16 33 34 36 37	AIN1R AIN1L AIN2R AIN2L AIN3R AIN3L AIN4L AIN4R AIN5L AIN5R	5.58V	Audio input terminal
3 4 19 35	EXTCTL1 EXTCTL2 EXTCTL3 EXTCTL4	2.5mA, ON →0.75V OFF →OPEN	General purpose output Opencollector
5	VOUT	1.10V	Video output terminal Push-pull output/Low-impedance
6 17 27 32 38	GND GND EXT-75ΩDR-GND DEC-75Ω-GND GND	0V	
7 13 18 23 28	VIN1 VIN2 VIN3 VIN4 VIN5	1.8V	Video input terminal Sync-tip clamp Input/Hi-impedance
8	PWRSAB	0.2V	Power save mode select pin OPEN : L
9	AUMUTE	0.05V	Control terminal for audio mute OPEN : L
12	REFFIL	4.94V	Terminal for Ref_DC ripple removing
14	VCC12		Vcc for audio
20	FSSOUT	H : Vcc-0.5V M : 6V L : 0V	FSS control terminal Output H, M, L 3 values with serial control
21	DATA		Confirmed to IIC BUS. Data input terminal
22	CLOCK		Confirmed to IIC BUS. Clock input terminal
24	VCC5A		Control Vcc for Video
25 26	VOUT75A VOUT75B	1.10V	Video driver output terminal Push-pull output/Low-impedance
29	VCC5B		Always VCC for Video
30 31 42 43	AOUT2L AOUT2R AOUT3L AOUT3R	4.91V	Audio output terminal Push-pull output/Low-impedance
39 40	AOUT1L AOUT1R	4.91V	Audio output terminal Push-pull output/Low-impedance
41 44	PWRMUTE1 PWRMUTE2	0V	Output terminal of audio muting

● Block Diagram



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4

7.3 OUTLINE OF THE PRODUCT

Main newly developed technologies

A

1. Pickup

The pickup supports quadruple-speed recording for the DVD-R/RW.
A liquid-crystal tilt servo system is adopted for the pickup.

B

2. Recording-signal-processing LSI

- UPD3330GC (DRIVE Assy: IC101)

The recording-signal-processing module of conventional models consists of two chips, but this has been integrated into a single newly developed recording-signal-processing LSI, enabling stable performance and cost reduction.

B

3. AV-signal-processing LSI

- M65673WG (MAIN Assy: IC1001)

The AV-signal-processing module of conventional models consists of eleven chips, but this has been integrated into a single newly developed AV-signal-processing LSI, enabling large-scale cost reduction while maintaining the conventional functions. In the new LSI, all the basic functions necessary for a DVD recorder have been integrated. Like conventional models, this model is designed to support multitasking. The main functions are as follows:

- C
- 3-D Y/C separation
 - Video decoding
 - Frame TBC
 - MPEG video encoding
 - Dolby Digital Consumer Encoding
 - ATA/ATAPI I/F (2 ch)
 - Main CPU (32-bit RISC, 54 MHz)
 - Graphics engine (OSD, scaling, mixing)
 - MPEG video decoding
 - Audio decoding (AC-3, MPEG)
 - Video encoding
 - Progressive conversion
 - Audio I/F
 - 3-D DNR for playback
- D

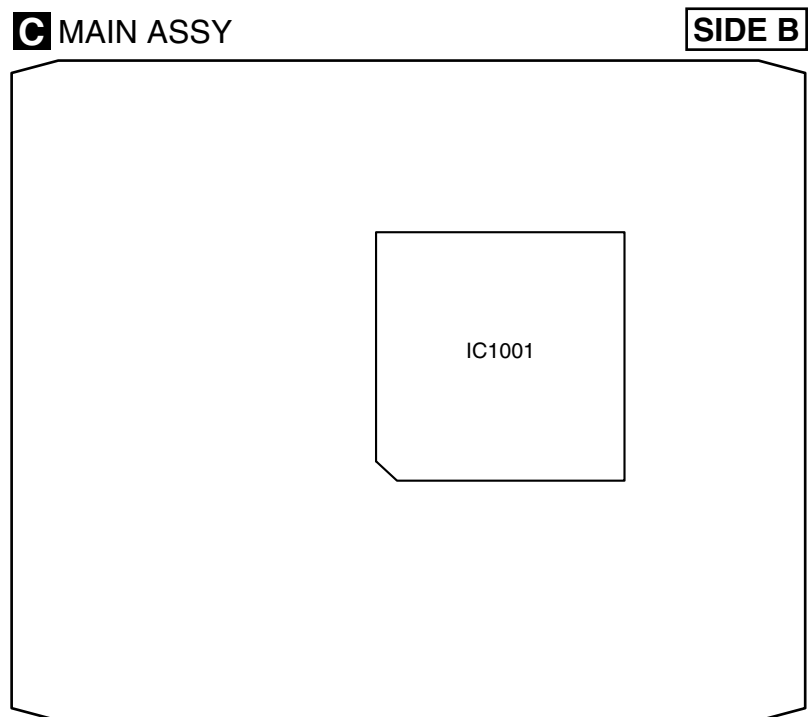


Fig.1 MAIN Assy

System configuration

In each signal-processing LSI of the main function blocks, various processes have been integrated into one chip, which enables simpler system configuration. With the AV-signal-processing LSI at the center, video inputs/outputs, audio inputs/outputs, writer and various memory cells are connected to it.

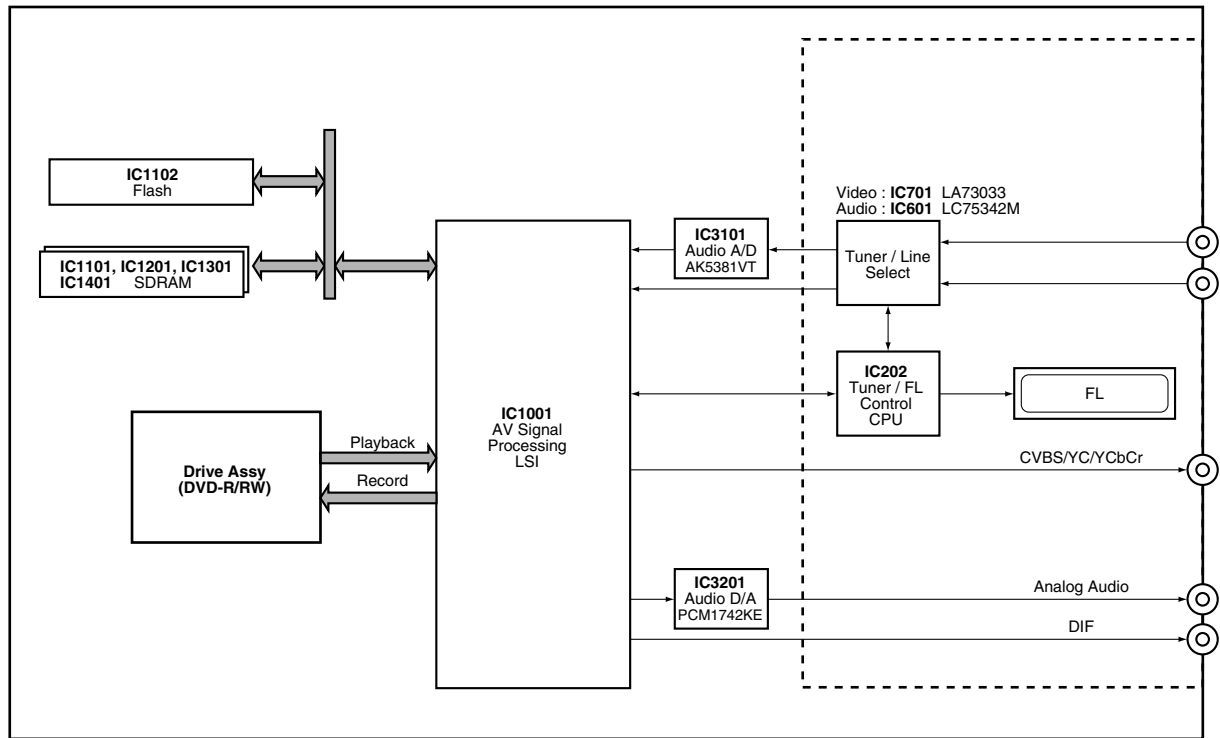


Fig2. System configuration

[Memorized Data]

- EEPROM (IC204 JCKB ASSY)
The information about Tuner is backed up.
(Pre-set CH, AFT ON/OFF, Skip CH, etc)
Information about timed recording
Other information
(The state of Volume, remote control mode and last positions (Line/Tuner, etc)
- CPU SDRAM (IC1101 MAIN ASSY)
The execution area and working area of a program
- FLASH ROM (IC1102 MAIN ASSY)
The storing area of a program code and setting information
- DEC SDRAM (IC1201 MAIN ASSY)
The working area of MPEG playback and OSD/Thumbnail
(OSD is mainly for Disc Menu creation in Video mode)
- ENC SDRAM (IC1301 MAIN ASSY)
The working area of MPEG recording and analog input and output (AVIO)
- ATA SDRAM (IC1401 MAIN ASSY)
The working area of ATA/OSD2/Audio TBC (OSD2 is for all GUI.)

New functions and specifications

In this model, the following new functions and specifications have been included in addition to those of conventional models:

1. Improved multitasking functions

This model supports DVD multitasking (only in VR mode), which was impossible with conventional models.

Ⓐ Pursuit playback

Playback of the title being recorded by the DVD drive in VR mode .

Ⓑ Simultaneous recording/playback

Playback of a title other than that being recorded by the DVD drive in VR mode.

2. Advanced disc NAVI

In the conventional disc NAVI function, recorded titles are displayed with still pictures as a list. In the advanced disc NAVI function, the title selected with the cursor is displayed as an animated picture with sound.

3. Improved Still Picture menu in Video mode

The disc NAVI function, which enables displaying a list of recorded titles with still pictures, is enabled in Video mode with this model. Selection from among nine title menus is also supported.

4. Adoption of MPEG2 SIF

In MN1-6 modes, MPEG2 SIF has been adopted, instead of the MPEG1 SIF of conventional models. This enables higher-quality recording for longer hours.

5. Improved editing functions

For DVD, the original/play-list editing in DVD-VR mode available with conventional models is provided.

The automatic-chapter-mark-insertion function in response to a change in audio type (stereo, monaural, bilingual) makes commercial-cutting editing easier.

5. Various-format playback

Playback of WMA, MP3, and JPEG formats is supported.

6. Other functions and specifications

The following main functions and specifications adopted with conventional models are also provided with this model:

- 192-kHz, 24-bit DAC
- 48-kHz, 20-bit ADC
- Digital 3-D Y/C separation circuit
- Digital frame TBC
- 3-D DNR
- Playback with commercials skipped

- CD/video-CD playback
- Picture creation
- Recording with 3/4-D1 and 2/3-D1 resolutions
- Recording mode with 32-step MNs
- LPCM recording
- High-resolution GUI

Disc / content format playback compatibility

General disc compatibility

This recorder is compatible with a wide range of disc types (media) and formats. Playable discs will generally feature one of the following logos on the disc and/or disc packaging. Note however that some disc types, such as recordable CD and DVD, may be in an unplayable format—see below for further compatibility information.



- Also compatible with KODAK Picture CD
- is a trademark of Fuji Photo Film Co. Ltd.

DVD-R/RW compatibility

This recorder will play and record DVD-R/RW discs.

Compatible media:

- DVD-RW Ver. 1.1, Ver. 1.1 / 2x and Ver. 1.2
- DVD-R Ver. 2.0 and Ver. 2.0 / 4x / 8x

Recording formats:

- DVD-R: DVD-Video format (Video mode)
- DVD-RW: Video Recording (VR) format and DVD-Video format (Video mode)

CD-R/RW compatibility

This recorder cannot record CD-R or CD-RW discs.

- Compatible formats: CD-Audio, Video CD, ISO 9660 CD-ROM* containing MP3, WMA or JPEG files
* ISO 9660 Level 1 or 2 compliant. CD physical format: Mode1, Mode2 XA Form1. Romeo and Joliet file systems are both compatible with this recorder.
- Multi-session playback: Yes (except CD-Audio and Video CD)
- Unfinalized disc playback: CD-Audio only

Compressed audio compatibility

- Compatible media: CD-ROM, CD-R, CD-RW
- Compatible formats: MPEG-1 Audio Layer 3 (MP3), Windows Media Audio (WMA)
- Sampling rates: 44.1 or 48kHz
- Bit-rates: Any (128Kbps or higher recommended)
- VBR (variable bit rate) MP3 playback: Yes
- VBR WMA playback: No
- WMA encoder compatibility: Windows Media Codec 8 (files encoded using Windows Media Codec 9 may be playable but some parts of the specification are not

supported; specifically, Pro, Lossless, Voice and VBR)

- DRM (Digital Rights Management) file playback: No (see also DRM in the *Glossary*)
- File extensions: .mp3, .wma (these must be used for the recorder to recognize MP3 and WMA files – do not use for other file types)
- File structure: Up to 99 folders / 999 files (if these limits are exceeded, only files and folders up to these limits are playable)

WMA (Windows Media Audio) compatibility



The Windows Media® logo printed on the box indicates that this recorder can playback Windows Media Audio content.

WMA is an acronym for Windows Media Audio and refers to an audio compression technology developed by Microsoft Corporation. WMA content can be encoded by using Windows Media® Player version 7, 7.1, Windows Media® Player for Windows® XP, or Windows Media® Player 9 Series.

Microsoft, Windows Media, and the Windows logo are trademarks, or registered trademarks of Microsoft Corporation in the United States and/or other countries.

JPEG file compatibility

- Compatible formats: Baseline JPEG and EXIF 2.2* still image files
* File format used by digital still cameras
- Sampling ratio: 4:4:4, 4:4:2, 4:2:0
- Horizontal resolution: 160 – 5120 pixels
- Vertical resolution: 120 – 3840 pixels
- Progressive JPEG compatible: No
- File extensions: .jpg, jpeg, jif, jfif (must be used for the recorder to recognize JPEG files – do not use for other file types)
- File structure: The recorder can load up to 99 folders / 999 files at one time (if there are more files/folders that this on the disc then more can be reloaded)

PC-created disc compatibility

Discs recorded using a personal computer may not be playable in this unit due to the setting of the application software used to create the disc. In these particular instances, check with the software publisher for more detailed information.

Discs recorded in packet write mode (UDF format) are not compatible with this recorder.

Check the DVD-R/RW or CD-R/RW software disc boxes for additional compatibility information.

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7.5 CLEANING

A



Before shipping out the product, be sure to clean the following positions by using the prescribed cleaning tools:

Position to be cleaned	Cleaning tools
Pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

Position to be cleaned	Cleaning tools
Fans	Cleaning paper : GED-008

B

C

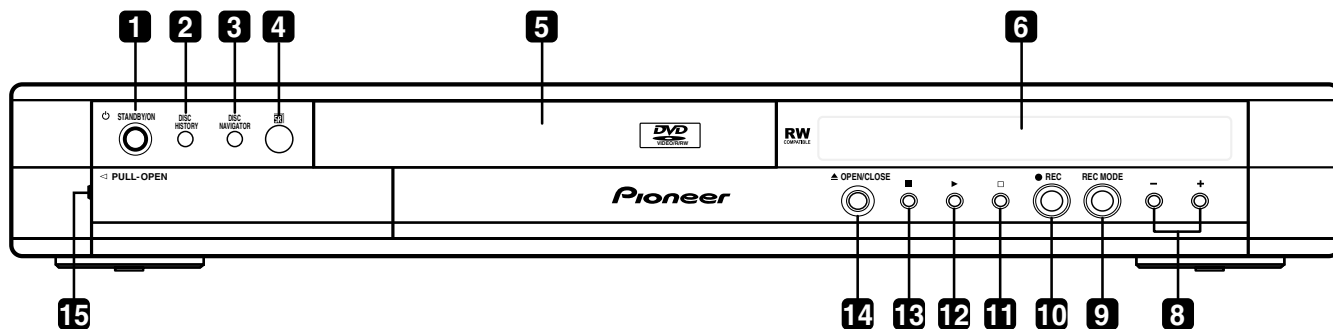
D

E

F

8. PANEL FACILITIES

Front panel



1 **STANDBY/ON**

Press to switch the recorder on/into standby.

2 **DISC HISTORY**

Press to display the Disc History screen.

3 **DISC NAVIGATOR**

Press to directly access the Disc Navigator screen.

4 **IR remote sensor**

5 **Disc tray**

6 **Front panel display**

See Display for details.

8 **+/-**

Use to change TV channels, skip chapters/tracks, etc.

9 **REC MODE**

Press repeatedly to change the recording mode (picture quality).

10 **REC**

Press to start recording.

11

Press to stop recording.

12

Press to start or restart playback.

13

Press to stop playback.

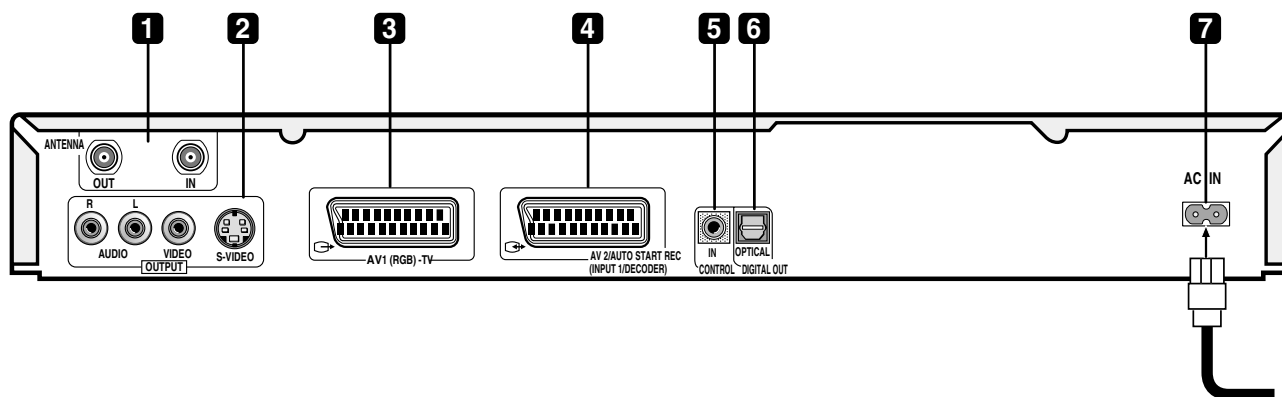
14 **OPEN/CLOSE**

Press to open/close the disc tray.

15 **Front panel inputs**

Pull the cover down where indicated to access the front panel input jacks. Especially convenient for connecting camcorders and other portable equipment.

Rear panel connections



1 ANTENNA IN/OUT

Connect your TV antenna to the **ANTENNA IN** jack. The signal is passed through to the **ANTENNA OUT** jack for connection to your TV.

2 OUTPUT jacks

Stereo analog audio, video and S-video outputs for connection to a TV or AV amplifier/receiver.


3 AV1(RGB)-TV AV connector

Audio/video output SCART-type AV connector for connecting to a TV or other equipment with a SCART connector. The video output is switchable between video, S-video and RGB. See AV1 Out for how to set this up.

4 AV2/AUTO START REC (INPUT 1/DECODER) AV connector

Audio/video input/output SCART-type AV connector for connecting to a VCR, or other equipment with a SCART connector. The input accepts video, S-video and RGB. See AV2/L1 Infor how to set this up.

5 CONTROL IN

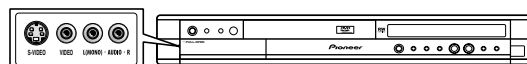
Use to control this recorder from the remote sensor of another Pioneer component with a **CONTROL OUT** terminal and bearing the Pioneer  mark. Connect the **CONTROL OUT** of the other component to the **CONTROL IN** of this recorder using a mini-plug cord.

6 DIGITAL OUT OPTICAL

For connecting to an AV receiver, Dolby Digital/DTS/MPEG decoder or other equipment with optical digital input.

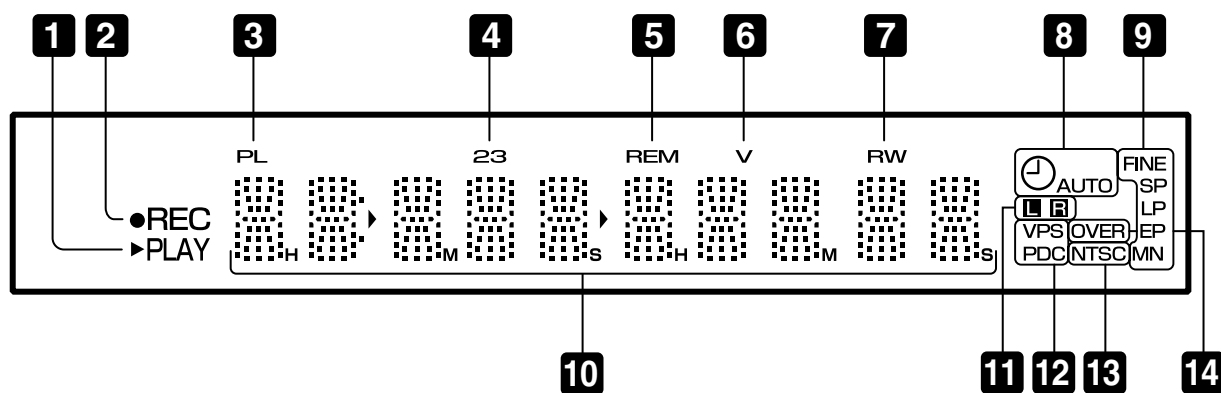
7 AC IN – Power inlet

Front panel connections



On the left side of the front panel a flip-down cover hides a third audio/video input, consisting of an S-video and standard (composite) video jack, and stereo analog audio jacks.

Display



1 ► PLAY

Lights during playback; blinks when paused.

2 ● REC

Lights during recording; blinks when recording is paused.

3 PL

Lights when a VR mode disc is loaded and the recorder is in Play List mode.

4 23

Shows the remote control mode (if nothing is displayed, the remote control mode is 1).

5 REM

Lights when the character display is showing the remaining available recording time.

6 V

Lights when an unfinalized Video mode disc is loaded.

7 R / RW

Indicates the type of recordable DVD loaded: DVD-R or DVD-RW.

8 ⏰

Lights when a timer recording has been set. (Indicator blinks if the timer has been set but there isn't a recordable disc loaded.)

AUTO

Lights when Auto Start Recording has been set, and during Auto Start Recording.

9 Recording quality indicators

FINE

Lights when the recording mode is set to **FINE** (best quality).

SP

Lights when the recording mode is set to **SP** (standard play).

LP

Lights when the recording mode is set to **LP** (long play).

EP

Lights when the recording mode is set to **EP** (extended play).

MN

Lights when the recording mode is set to **MN** (manual recording level) mode.

10 Character display

11 [L] [R]

Indicates which channels of a bilingual broadcast are recorded.

12 VPS / PDC

Lights when receiving a VPS/PDC broadcast during a VPS/PDC-enabled timer recording.

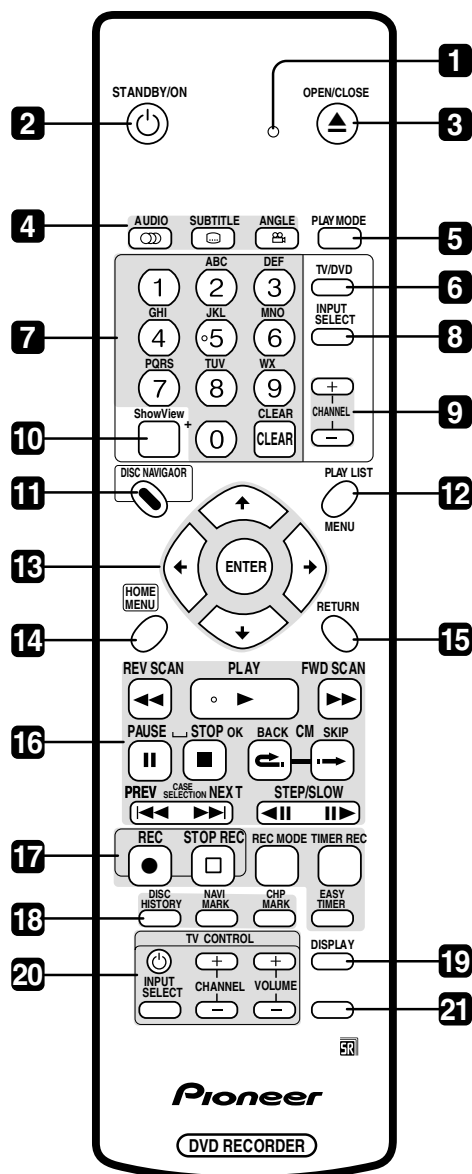
13 NTSC

Lights when playing NTSC format video.

14 OVER

Lights when the analog audio input level is too high.

Remote control



1 Remote control indicator

Lights when setting up the remote control for use with a TV and when setting the remote control mode

2 STANDBY/ON

Press to switch the recorder on/into standby.

3 OPEN/CLOSE

Press to open/close the disc tray.

4 DVD playback functions

AUDIO

Changes the audio language or channel. (When the recorder is stopped, press to change the tuner audio.)

SUBTITLE

Displays/changes the subtitles included in multilingual DVD-Video discs.

ANGLE

Switches camera angles on discs with multi-angle scenes.

5 PLAY MODE

Press to display the Play Mode menu (for features such as search, repeat and program play).

6 TV/DVD

Press to switch between 'TV mode', in which you get the picture and sound from the TV's tuner, and 'DVD mode', in which you get picture and sound from the recorder's tuner (or an external input).

7 Alphanumeric buttons and CLEAR

Use the number buttons for track/chapter/title selection; channel selection, and so on. The same buttons can also be used to enter names for titles, discs and so on.

Use **CLEAR** to clear an entry and start again.

8 INPUT SELECT

Press to change the input to use for recording.

9 CHANNEL +/-

Press to change the channel of the built-in TV tuner.

10 ShowView, Video Plus + (for WV model)

Press, then use the number buttons to enter a ShowView programming number for timer recording.

11 DISC NAVIGATOR / TOP MENU

Press to display the Disc Navigator screen, or the top menu if a DVD-Video disc is loaded.

12 PLAY LIST / MENU

Press to switch between Original and Play List content on VR mode discs, or display the disc menu if a DVD-Video disc is loaded.

13 (cursor buttons) and ENTER

Used to navigate all on-screen displays. Press **ENTER** to select the currently highlighted option.

14 HOME MENU

Press to display the Home Menu, from which you can navigate all the functions of the recorder.

15 RETURN

Press to go back one level in the on-screen menu or display.

16 Playback controls

◀◀ REV SCAN / FWD SCAN ▶▶

Press to start reverse or forward scanning. Press again to change the speed.

▶ PLAY

Press to start playback.

⏸ PAUSE

Press to pause playback or recording.

■ STOP

Press to stop playback.

CM BACK (commercial back)

Press repeatedly to skip progressively backward through the audio or video playing.

CM SKIP (commercial skip)

Press repeatedly to skip progressively forward through the audio or video playing.

◀◀ PREV / NEXT ▶▶

Press to skip to the previous or next title/chapter/track/folder; or to display the previous or next menu page.

◀◀ STEP/SLOW ▶▶

During playback, press to start slow-motion playback; while paused, press to show the previous or next video frame.

17 Recording controls

● REC

Press to start recording. Press repeatedly to set the recording time in blocks of 30 mins.

□ STOP REC

Press to stop recording.

REC MODE

Press repeatedly to change the recording mode (picture quality).

TIMER REC

Press to set a timer recording from the standard Timer Recording screen.

EASY TIMER

Press to set a timer recording from the Easy Timer Recording screen.

18 DISC HISTORY

Press to display summary information (disc name, recording time left, etc.) from the last 30 recordable discs loaded.

NAVI MARK

Press to select a thumbnail picture for the current title for use in the Disc Navigator screen.

CHP MARK

Press to insert a chapter marker when playing/recording a VR mode DVD-RW disc

19 DISPLAY

Displays/changes the on-screen information displays.

20 TV CONTROL

After setting up, use these controls to control your TV.

21 TV DIRECT REC

Press to start recording whatever channel your TV is set to.

■ Jigs list

A

Name	Jig No.	Remarks
Service Remote Control Unit	GGF1381	adjustment, diagnosis
DVD Test Disc (DVD-Video)	GGV1025	Check of DVD-Video
DVD Recorder Data Disc	GGV1179 (*)	diagnosis (ID data setting)

(*) : GGV1134 is now released, however GGV1179 will be released in JUNE/2004.
Until GGV1179 is released, use GGV1134 data disc.

B

C

D

E

F